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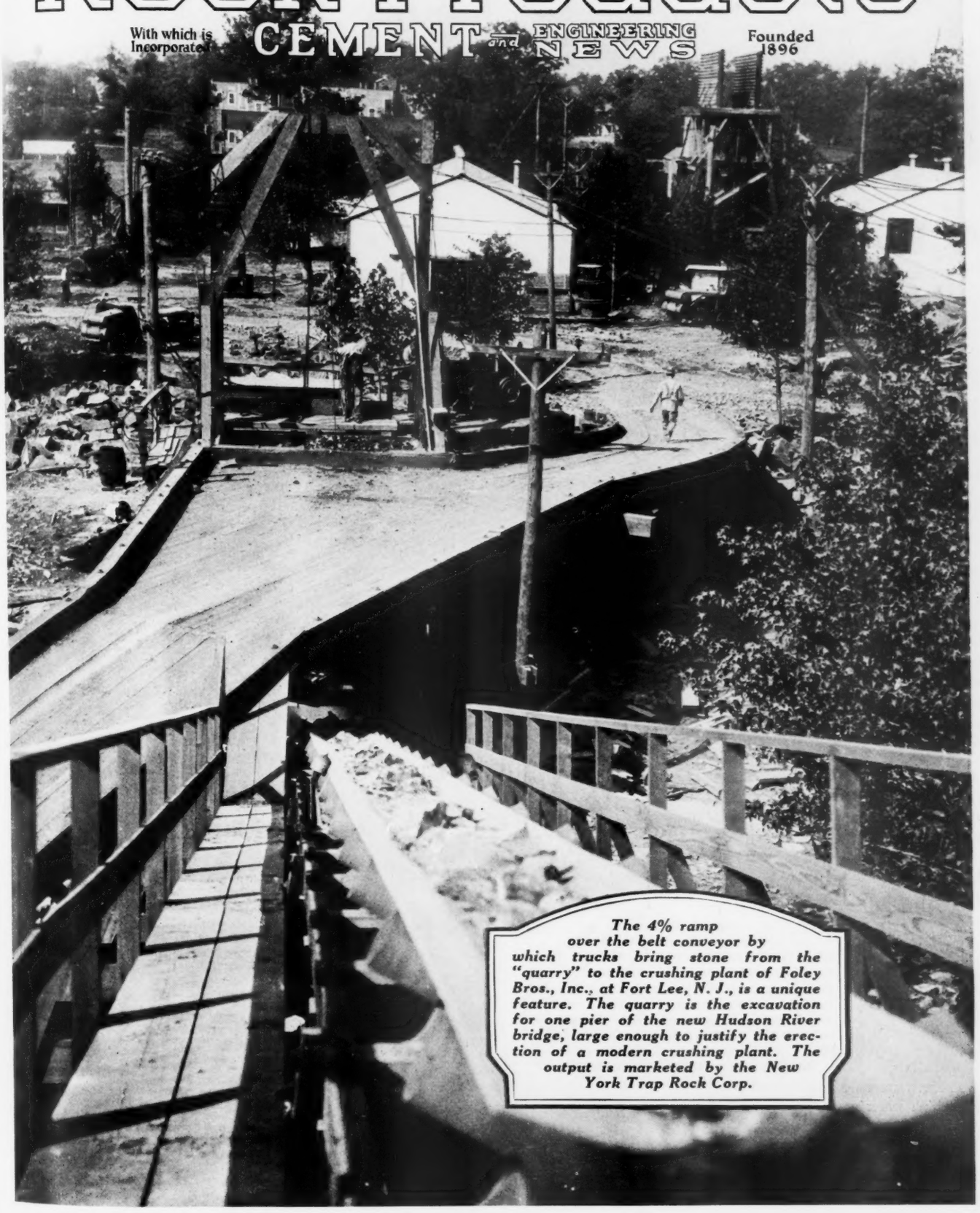


The 4% ramp over the belt conveyor by which trucks bring stone from the "quarry" to the crushing plant of Foley Bros., Inc., at Fort Lee, N. J., is a unique feature. The quarry is the excavation for one pier of the new Hudson River bridge, large enough to justify the erection of a modern crushing plant. The output is marketed by the New York Trap Rock Corp.

General view of Foley Bros., Inc., crushing plant near Fort Lee, N. J. The plant was built and producing in 49 days

Opening of Crushing Plant Starts Work on Hudson River Bridge

Foley Brothers, Inc. Crushing Plant at Fort Lee, N. J., to Supply 1000 Tons Per Day for New Bridge Pier—Output Sold to New York Trap Rock Corp.

By George M. Earnshaw

THE official ground breaking ceremonies for the Hudson River bridge were held a few weeks ago and attended by the most prominent officials from the states of New York and New Jersey. There was much ado about it. The *actual* start of the bridge, however, was made much before that time, on August 2, with no fuss or ceremony at all, when Foley Brothers Inc., contractors of St. Paul and New York, started excavating for a stone crushing plant on the site of the west pier of the bridge, near Ft. Lee, N. J. A 1000 tons per day crushing plant, erected for the sole purpose of crushing the stone taken from the excavation for *one* pier of one bridge! *Some bridge!*

It *will* be "some bridge," and to give Rock Products' readers an idea of how big it is, we give a few of its specifications: This will be the largest bridge in the world. It will have a main suspension span of 3,500 ft. (the entire width of the river) exactly twice the length of the longest span now in existence. Each side span will be approximately 650 ft. long, making a total length of 4800 ft. Each of the two towers will rise 625 ft. above the ground level. The bridge floor will be 240 ft. above water level, leaving a clear height of 195 ft. above mean high water at the towers and 206 ft. at the center of the main span under normal temperature and without load. It is not expected that the structure will be opened before the summer of 1932.

It is said that Foley Brothers Inc. were the low bidders on the job of excavating for the west tower because they had an idea which, apparently none of the other bidders had. That idea was to put in a crushing plant and *sell* the stone instead of merely excavating it and dumping it on ground leased for the purpose, located a great distance from the site. So overnight, almost, the crushed stone industry had another producer added to its ranks.

Putting down holes with a jackhammer drill

Engineers estimated that the stone to be removed will aggregate between 450,000 and 500,000 tons. The total length of the excavation is 780 ft.; the width at the river end is 162 ft. and at the far end, 119 ft. They will go to a depth of 97 ft. at the river end and to an average depth of 30 ft. at the other. In addition to this there will be two pits, each 30x81 ft., 42 ft. deep and two anchorage tunnels, each 44 ft. wide, 70 ft. high and 167 ft. long. All of this is solid diabase trap-rock; about a half million tons.

It was decided to erect a 1000 tons capacity plant in order that the job of excavating and crushing the entire amount might be accomplished within a two-year period, at the longest. Because of the hardness of the stone it was necessary to select unusually heavy machinery and equipment, with cost a secondary consideration.

The plant itself is very simple in design, consisting of the usual primary crusher, scalping screen, secondary crusher, bucket elevator, sizing screens and fine reduction crushers.

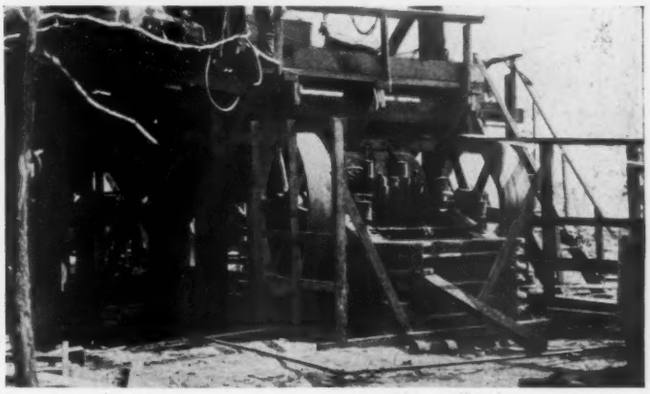
Stone is hauled from the quarry by a fleet of three 7½ ton Mack trucks, equipped with 10 ton capacity springs and special Heil "Battleship" dump bodies. The trucks approach the crusher from the rear, up a timber incline of 4 per cent grade, and rear-dump directly into the crusher. They depart in the opposite direction down a similar incline, allowing a continuous operation.

This large area will be excavated to produce the 500,000 tons of stone needed for one of the bridge piers. A plan of the project is shown on page 53

All drilling is with jackhammer or tripod drills, well drills not being adapted to the work

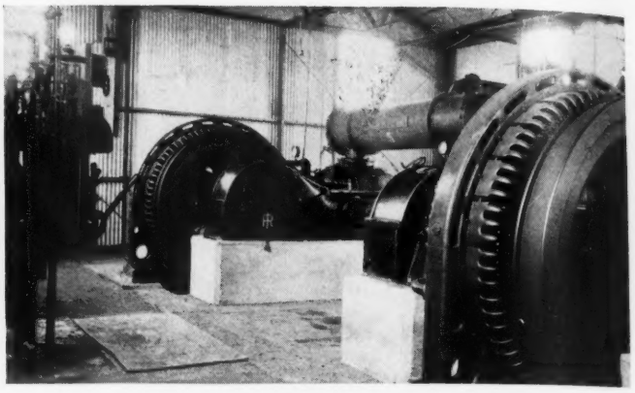
Eectric shovel and motor trucks are used in the quarry in accordance with modern practice

End of incline from quarry showing a truck dumping to the primary jaw crusher



Close-up of the 40x48-in. jaw crusher which is set to reduce the stone to 7-in. size

Single-drum gasoline hoist operating cable and hook used to prevent bridging at the jaw crusher



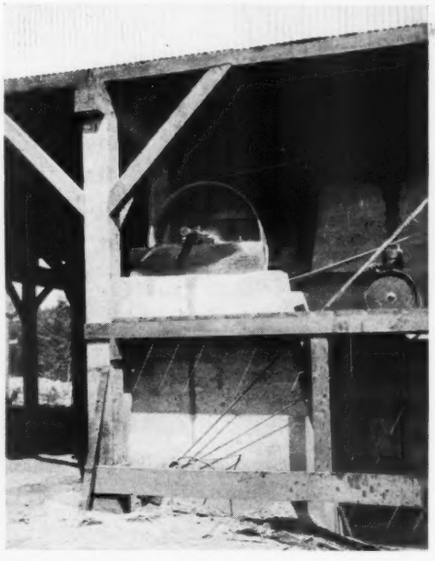
One of 1600-cu. ft. air compressors and its 300 hp. synchronous motor drive

The primary crusher is a 40x48 in. Buchanan jaw, belt driven by a 125-hp. type CW. Westinghouse induction motor. (All motors in the plant are of this make, excepting those on the air compressors, and all operate on 440 volt, 60 cycles, 3 phase current.) The crusher is set to discharge at 7 in. Occasional "bridging" of large stones in the crusher is taken care of by the use of a cable and hook, powered by a small single-drum Street Bros. hoist, driven by a 15-hp. Le Roi gasoline engine.

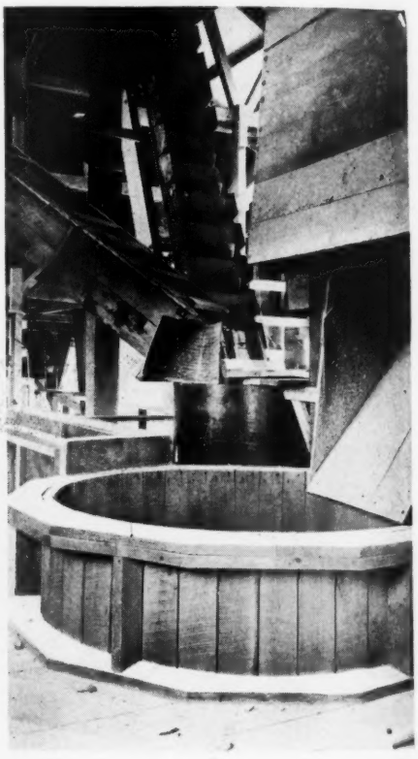
A 30-in. Goodyear belt conveyor of 119 ft. centers, carries the stone, at an 18 deg. incline, to the plant proper where it discharges into a 60 in. by 12 ft. Telsmith scalping screen. This screen is fitted with screen sections having 2-in. perforations and a woven-wire outer jacket of ⅜-in. openings. The rejections from the screen are chuted to two No. 13-A Telsmith gyratory crushers, each belt driven by a 50-hp. induction motor. The product of these crushers and the product of the scalping screen, excepting the screenings, flows by gravity to a belt-bucket elevator which elevates to the sizing screens. The elevator is made up of 30-in. buckets and a 32-in. belt. Its centers are 80 ft. and it is driven by a 60-hp. motor.

The flow of stone from the elevator is split and sent into two 60 in. rotary screens, 24 ft. long, fitted with ⅝-in., 1-in. and 2-in. perforated screen sections. Over these there is an 8 ft. dust jacket with ⅛-in. perforations. These screens are each driven by a 20-hp. motor, and they, like the elevator and the four reduction crushers, were furnished by the Smith Engineering Works. Rejections from the sizing screens return by gravity to two No. 40 Telsmith reduction crushers, each belt-driven by a 40-hp. motor. The output of these crushers is chuted to the bucket elevator previouly mentioned.

Belt conveyor from jaw crusher to scalping screens



One of the secondary gyratory crushers



Bucket elevator (rear) carrying stone from secondary crusher to sizing screens

In this way the plant produces three sizes, in addition to "screenings": ⅜-in., ¾-in. and 1½-in. Perhaps the best feature of Foley Brothers' whole proposition is that their entire output is contracted for by the New York Trap Rock Corp. for George M. Brewster and Son, large contractors and dealers of Bogota, N. J. The plant is especially interesting because all the stone that enters it and leaves it is hauled by motor trucks.

Drilling is perhaps one of the most important problems on the job and the company has taken every measure possible to see that they have the most efficient equipment. Practically all kinds of drills are being tried out. They are all of the tripod or jackhammer type, the well-drill type not being employed due to the fact that no great depth of hole is required and because heavy shots are forbidden by proximity of plant to the city. At the time of the writer's visit there were on the job two tripods, four jackhammers, one sinker and one breaker furnished by Ingersoll-Rand; one tripod, one

sinker and two jackhammers furnished by Denver Rock Drill Co.; and one tripod, two sinkers and one jackhammer furnished by Gilman. Two class PRE Ingersoll-Rand compressors of 1600 cu. ft. capacity per minute, each driven by a 300 hp. General Electric synchronous motor, furnish the necessary air for this large corps of drills. These machines are housed in a separate building near the crushing plant. A Class "A" Sullivan drill sharpening outfit is in continuous duty in the blacksmith shop.

A Model 37 Marion shovel at the present time is keeping the three trucks loaded as fast as they can come to it. This machine is a full-electric with Ward-Leonard control. It has a 75 hp. generator; 50 hp. hoisting motor; 20 hp. swinging motor. All were furnished by Westinghouse.

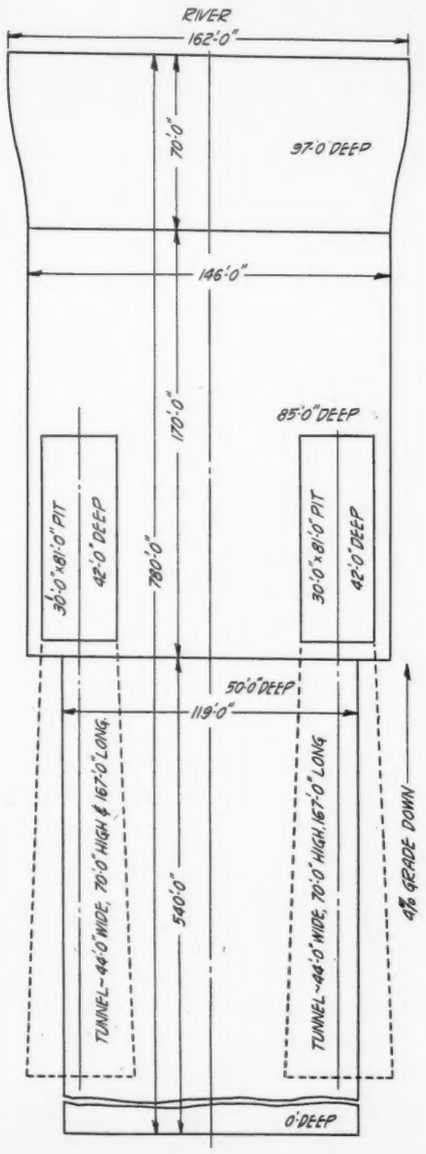
It is hard to believe that such an excellent plant as this one was completed in such a short time. Ground was broken for its foundations on August 2, and it was operating and *producing* a finished product on September 19. If this is a typical example of the way Foley Brothers Inc. do things, they will no doubt complete the excavation in a shorter time than two years.

The engineer in direct charge of the entire operation is G. H. Wilsey. His assistants are J. H. Holmes, superintendent of plant construction and Oscar Carlson, superintendent of operation. The company's eastern office is located at 117 Liberty St., New York City. C. L. Swenson is eastern manager.

Contracts Awarded for Drilling More Potash Test Wells

CONTRACTS for the drilling of two additional potash test wells in southeastern New Mexico have been awarded by the United States Bureau of Mines, Department of Commerce, to the Sullivan Machinery Co. of Chicago, which submitted the lowest bids for the work. Under the terms of the contract, drilling operations are to start within a short time. Both new locations, which are recommended by the United States Geological Survey as giving favorable indications of the existence of potash beds, lie in Eddy County, New Mexico.

The site of potash well No. 2 is in the northeast corner of Sec. 14, T. 20 S., R. 29 E., approximately 37 miles from Artesia, N. M., and 25 miles from Carlsbad, N. M.



Plan of excavation work for the new bridge

The depth to the top of the salt beds at this location is estimated at about 500 feet. Drilling will be continued to a depth of 1,000 or 1,500 ft., as conditions may determine, this allowing penetration of most of the estimated thickness of the salt beds in this region.

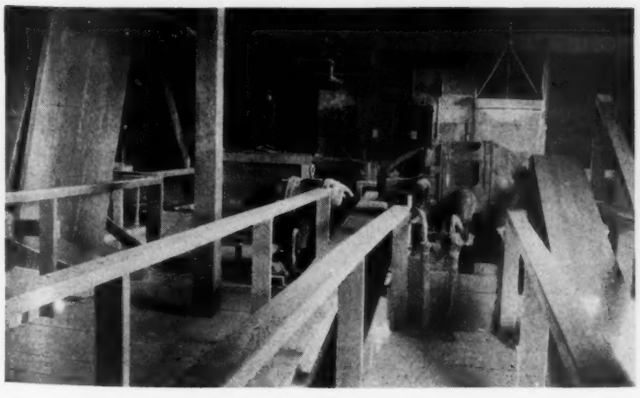
The site of potash well No. 3 is in the SW. ¼ of Sec. 34, T. 22 S., R 30 E., and is about 28 miles from Carlsbad. The depth for drilling is the same as for well No. 2.

Both locations are on the western limit of the potash-bearing salt beds identified in this region, and have a minimum of overburden. For each test a continuous core will be taken from top to bottom and each hole must bottom with not less than a 2½-in. core.

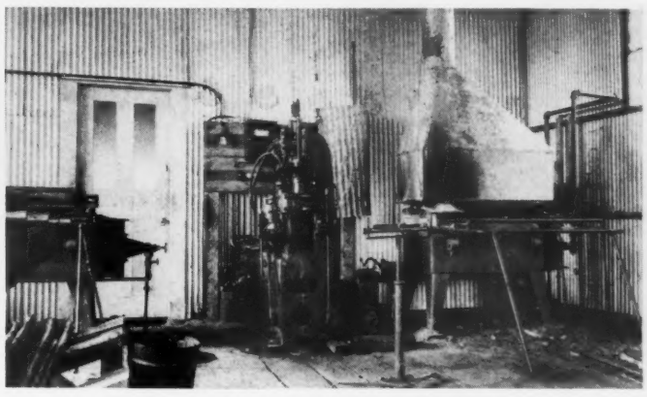
The diamond-drilling outfit used in the drilling of potash well No. 1, also located in Eddy County, will be moved immediately to the site of well No. 2. The drilling of potash well No. 1 was completed April 9, at a depth of 1,847 ft. 6 in., drilling operations having been in progress since February 21. At this location, the hole penetrated the salt beds at a depth of about 850 ft. Various favorable showings of potash-bearing salts were encountered in this well. To a depth of 150 ft., coring of the soft "red beds" overlying the salt formation, with equipment consisting of a standard bit and single-tube core-barrel, was attempted unsuccessfully. From 150 ft. to the bottom of the hole a specially designed bit and double-tube core-barrel were used and 1,600 ft. of core, amounting to 94%, was recovered. The 6% loss was due to attrition, and to occasional thin seams of sand or soft clay interbedded in the harder formation.

The cores taken from potash well No. 1 have been turned over to the Geological Survey for study and analysis. Detailed information as to their composition will be announced later. At this well, the casing has been pulled and the hole plugged with cement with a view to affording protection against surface and underground waters, to possible potash-mining operations.

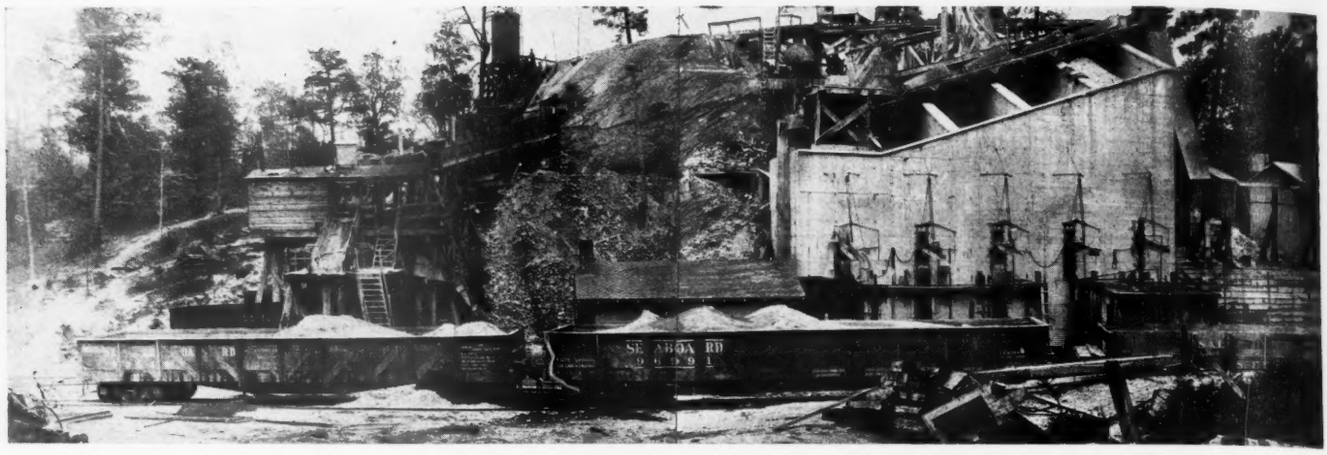
James S. Worth, engineer in charge of potash investigations for the United States Bureau of Mines, is actively supervising the drilling operations.



Electric motor drive on the reduction crushers



Drill-sharpening outfit in blacksmith shop



General view, Lilesville, N. C., sand and gravel plant of the W. R. Bonsal Co., Inc. Washed ballast plant at left

Originality Used in This Gravel Plant

Lilesville, North Carolina, Operation of W. R. Bonsal Company

THE W. R. Bonsal Co., Inc., is a large contracting concern which is also a considerable producer of materials. It has operated sand, gravel and crushed stone plants in a number of places in the southeastern states. The most important of these operations, in point of tonnage at least, is the sand and gravel plant at Lilesville, which is not far from Wadesboro, N. C. This has produced as much as 120 cars in a 24-hr. day, a part being washed gravel ballast and the remainder concrete aggregate.

This operation is on one of the few large deposits which are found on the south Atlantic coast. It lies on the fall line which divides the Piedmont plateau from the coastal plain and it is thought that the gravel came from the quartz veins which were originally in the old rocks now weathered to soil. The appearance of the gravel tends to bear out this theory, for the pebbles are all of snow white quartz, well rounded from having been transported by water.

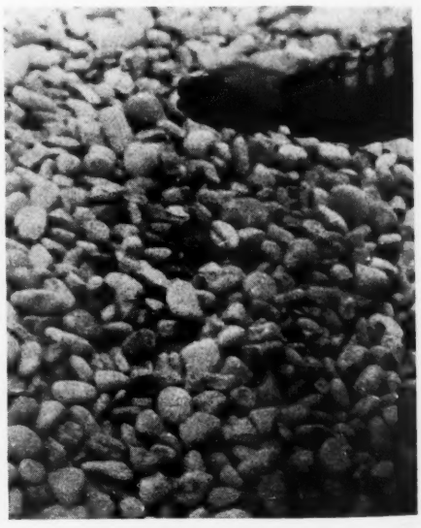
It is said gravel of this character can be found extending for many miles through Anson county in which Lilesville is situated. The Bonsal company controls a large area and its workings cover hundreds of acres. At present it is working in two separated points transporting the gravel by a narrow gage railroad to the plant.

As in all the gravel operations which have been visited in the southeastern states, the dragline excavator is the machine used to dig the material from the bank. The Bonsal company has two of these, a Class 20 and a Class 24 Bucyrus. Both have booms 85 ft. long Page buckets with manganese steel wearing parts are used with these, one of 2½-yd. and one of 4-yd. capacity.

The ground has to be stripped, the overburden being as deep as 12 ft. in places. The same machine strips and loads the gravel, and as the strippings have only to be side cast into the worked out area, the machine can strip between the trips of the train taking the material to the plant. The gravel is about 30 ft. thick, below the overburden, and the lower part is under water.

The cars used hold 8-yd. and they were made by the Western Wheeled Scraper Co. There are four American locomotives and one Davenport, all of 36-in. gage. The track is very well laid, especially the part which is permanent, in which 65-lb. rail is used. The farthest working is about a mile from

Dragline working in the deposit. The piles in front are strippings from the 12 ft. of overburden

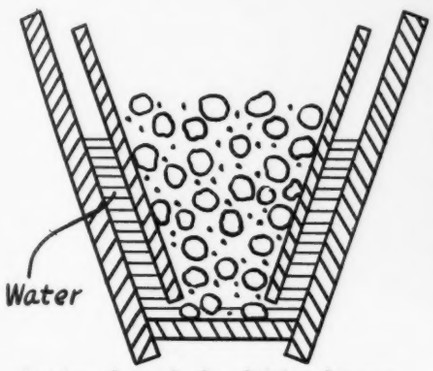


The gravel is almost pure quartz and snow-white. This shows part of the 2 1/2-in. stock pile

the plant following the line of the railroad.

The line comes in on the crest of a hill above the plant and here the cars are dumped into either of two hoppers, one for the washed ballast plant and one for the aggregate plant. These hoppers play an important part in the washing process and they are ingeniously designed to furnish a steady feed to the plants, provided the cars are dumped into them with some regularity.

Each hopper has a lining, or false sides and ends, separated from the outer hopper by a 4-in. space. The water is admitted at the bottom with very little pressure. It flows up into the space between the walls and the lining and works on the material in the hopper along the full length. In this way it washes about the same amount of material into the sluice regardless of whether the



Section through the sluicing hopper

hopper is nearly full or partly empty. The material does not arch when the water is fed to it this way. About the only attention needed is to take care of the larger stones and any lumps of clayey material, and one man easily attends to this.

Ballast Plant

The washed ballast plant is very simple. From the sluicing hopper a flume extends for about 75 ft. There is an enlargement in this flume which serves to spread the gravel and slow it up so that the water, flowing faster, will have a scrubbing action through this part of the flume. The flume discharges to a small hopper and then to a Link-Belt vibrating screen provided with washing sprays. The screen is covered with Rol-man manganese steel wire cloth with ¼-in. mesh, which lasts considerably longer than ordinary steel wire cloth. The oversize of the screen is washed gravel ballast and runs directly from the screen to a railway car and the undersize goes to two sand tanks which are hoppers 9x10 ft. at the top. Each is closed with a simple valve operated by a rod which extends downwardly from a lever above the tank. The lever can be set to give any opening desired to the valve below. This sand is also run directly to cars and if it cannot be shipped immediately it is sent to the storage yard where it is unloaded by a Browning locomotive crane.

Aggregate Plant

The aggregate plant is built almost wholly of reinforced concrete. Everything is supported on a block of bins 50 ft. long and 24 ft. wide, partitioned to make five bins. The walls are 30 in. thick at the bottom and taper to 4 in. at the top and they are not only reinforced but held together by tie rods that cross at the corners.

The layout of this plant is most unusual,

The plant hopper from which the material is sluiced to the washing plant

for the belt which brings in the material parallels the line of screens. This has made a very compact layout but one possible only where the material is delivered at a point above the plant, as it is in this case.

The sluicing hopper is the same as the one described in connection with the ballast plant. From this hopper the material goes to a sand screen, of the Dull conical pattern, which removes the water and a good deal of the sand. The oversize of this screen falls on a conveyor belt with herringbone cleats, by which it is carried up to the first of the gravel screens of the plant.

This belt was made by cutting herringbone shaped pieces from an old belt and riveting them on the conveyor belt, for the purpose of preventing either water or rounded pebbles from rolling back on the belt. Straight cleats were tried, but the herringbone cleats were found to work better and cost no more to make or to put on the belt.

At the discharge point of the belt the gravel is caught in a steel chute with a heliocoidal bottom so that it makes a turn and flows into the first screen with very little loss of headroom. There are four screens, all of the Dull (Link-Belt) pattern and they have 2¼-in., 1½-in., 1-in. and ¼-in. holes respectively. A considerable amount of material is sold as mixed sizes and the mixing is done in a simple way by blanking off a part of the larger screens so that some undersize will go in with the oversize. In this way instead of producing a 2¼-in. to 1½-in. material, the 2¼-in. screen is made to produce "2¼-in. and finer," including everything down to sand size, and the 1½-in. screen is made to produce "1½-in. and finer."

The sand from the sand screen used before the belt goes to an Allen sand tank of the square type and the sand from the sand screen which is the last of the four in line, goes to an Allen cone of the regular conical type. These are sand classifiers and dewaterers which are operated by a float controlled valve, giving a dewatered product at the spigot. The overflow of these sand tanks goes to waste.

The material dug from the bank contains considerable red clay and appears hard to wash, but the plant described makes exceptionally clean material from it. The main reason for this is the abundance of water used in the process. A lot of water is used in sluicing from the hopper and this, in connection with the rolling and tumbling it gets

Loading cars from the stock pile

in going through the sluice, scrubs the pebbles pretty well. Then there are heavy sprays in each of the screens to rinse the pebbles free from any adhering clay.

The oversize, rejected by the first of the gravel screens, goes to a No. 5 McCully crusher. This was originally designed as a primary crusher (it was built in 1910), but it has been converted to a reduction crusher by making the concaves stand more nearly vertical by the use of a steel ring and a backing of concrete. It was freely predicted that this concrete backing would break, before it was put in, but it is still solid after some months of service.

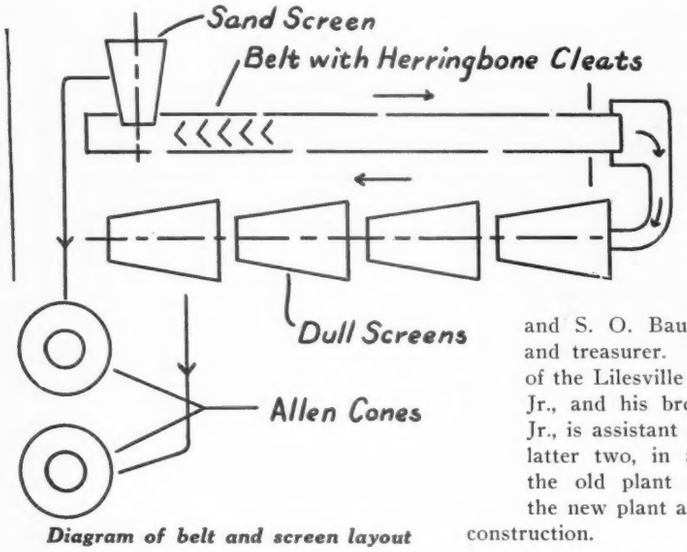


Diagram of belt and screen layout

The whole plant is direct driven except for an auxiliary 20-hp. Western Electric motor which is used on one of the screens. The engine is a type Y, Fairbanks-Morse oil engine rated at 50-hp. but capable of delivering about 70-hp. Most of the machinery is driven by chains and sprockets.

Pumping takes much more power than screening and crushing. The pumping station, is a short distance below the plant, and it contains a 100-hp. Fairbanks-Morse Type Y oil engine and a Fairbanks-Morse centrifugal pump. This pumping station is new and takes the place of a steam plant that is fitted with return flue boilers and triple-compound pumps of a type considered the acme of efficiency in its day. Another steam pumping plant is still operated, but it is shortly to be replaced by a modern centrifugal pump plant with oil engine drive.

The company has its main office in Hamlet, N. C. W. R. Bonsal is president and S. O. Bauersfeld is secretary and treasurer. The superintendent of the Lilesville plant is F. J. Cloud, Jr., and his brother, O. L. Cloud, Jr., is assistant superintendent. The latter two, in addition to keeping the old plant operating, designed the new plant and superintended its construction.

Canada Using Bituminous Sands to Surface Roads

SUCCESSFUL experiments with the application of the tar sand deposits at Fort McMurray in northern Alberta to the surfacing of highways in Alberta are reported to the Depatment of Commerce by the commercial attache at Ottwa, Lynn W. Meekins. The full text of his report follows:

To prepare the sand for application to the roads a small plant has been installed at Jasper Park, Alberta, whose daily output is estimated at about 520 yd. of 2-in. compacted surface. One mile of surface requires about 900 tons or 30 carloads of bituminous sand.

The sands are first prepared by mixture with a local aggregate, then dumped through chutes into two revolving drums which are internally heated by an oil burner to a temperature of 325 deg. Fahrenheit, which vaporizes the lighter oil. The treated material is then applied to the road and rolled by a 7-ton roller in the same manner in which asphalt is used. It is reported that the surface is ready for traffic three hours after being compacted.

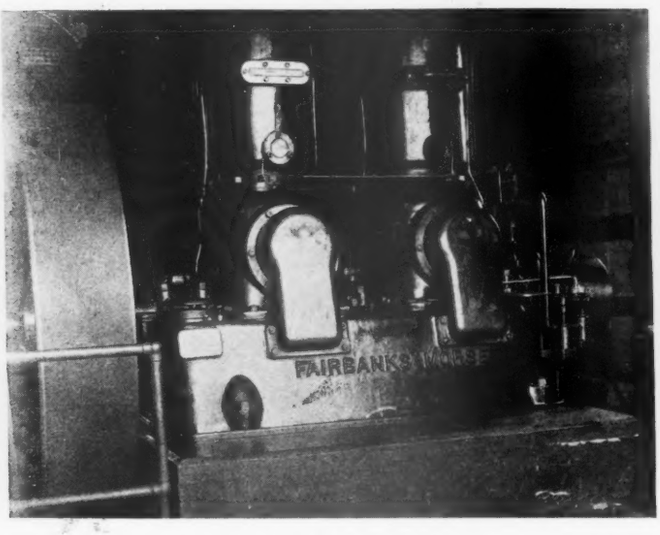
The final cost of the surfacing at Jasper Park was $1.04 per sq. yd. compared with $1.23 per sq. yd. for similar work with imported materials in Edmonton, the nearest city. Engineers claim that the cost can be reduced 25% with installation of labor-saving devices and improved equipment and minor alterations in the plant, making the cost about $0.78 per yard.

It is said in Canada that a California syndicate has formed the Altapave Manufacturing Co., obtained holdings in the bituminous sand area and is prepared to spend $200,000 in development as soon as the railway is extended 3½ miles.—*United States Daily.*

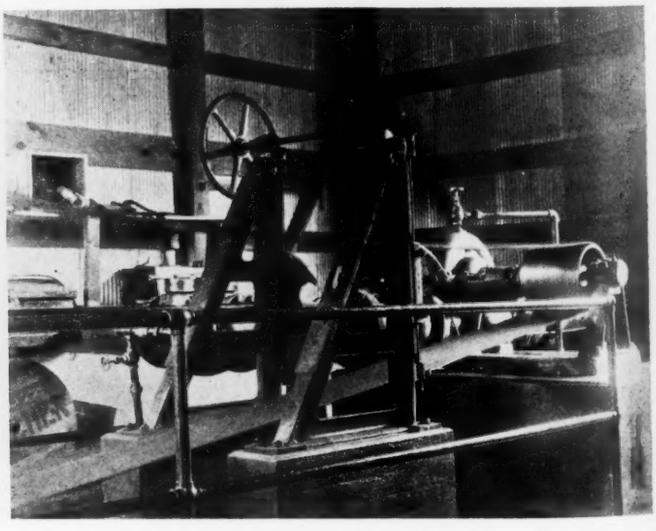
Research in Concrete

HOW heat and weather affect concrete will be more accurately known upon the conclusion of tests now in progress at the College of Engineering of the University of Wisconsin, it is reported. One series of experiments directed by Prof. E. R. Maurer is designed to find how the high temperatures of the interiors of reinforced concrete chimneys act upon the concrete. The investigation was suggested by a committee of the American Concrete Institute.

C. A. Wiepking is conducting a second group of tests which are to extend over a period of 100 years. He has made some 3000 concrete and mortar specimens which are to be tested after exposure to the weather for different periods ranging up to 100 years.



Oil engine in the pump house



Centrifugal pump and drive

General view of the fuller's earth mine at Riverside, Texas

Riverside, Tex., Fuller's Earth Plant

The Riverside Operation of the Texas Company

By J. B. Tomberlin
Superintendent, Riverside Plant, Texas Co.

FULLER'S EARTH is a variety of clay that has a high capacity for absorbing organic and mineral impurities from solution in various liquids. It is of particular interest to the petroleum industry for the reason that it will remove basic coloring matter from mineral oils.

The petroleum industry consumes over 80% of the fuller's earth produced in the United States, using it primarily for filtering lubricating oils, with a small amount for purifying burning oils. Some is used by the vegetable and animal oil industries, particularly in manufacturing vegetable lards and cooking oils. Some is also used in what most of us know as "face packs." Fuller's earth is the principal ingredient of most of the "Mystic Beauty Clays" so widely advertised of late.

The Texas Co. began the use of fuller's earth for treating lubricating oil about 1909, and by 1919 the amounts required had become so large that investigations were begun tending towards securing its own supply. These investigations were confined closely to the Florida-Georgia deposits known to be of high grade and large extent, and were carried out systematically and thoroughly, with the result that in 1920 this company purchased a large acreage in the center of what is known as the Quincy district. Ex-

Shovel loading at the mine

cellent clay in quantity sufficient to supply many years' needs has been developed and the property is considered a most valuable reserve resource. Immediate development was delayed, however, and in the meantime little known deposits in Texas became of commercial importance. On account of proximity to Texas refineries a thorough investigation was started in 1921, the result of which is the present Riverside plant.

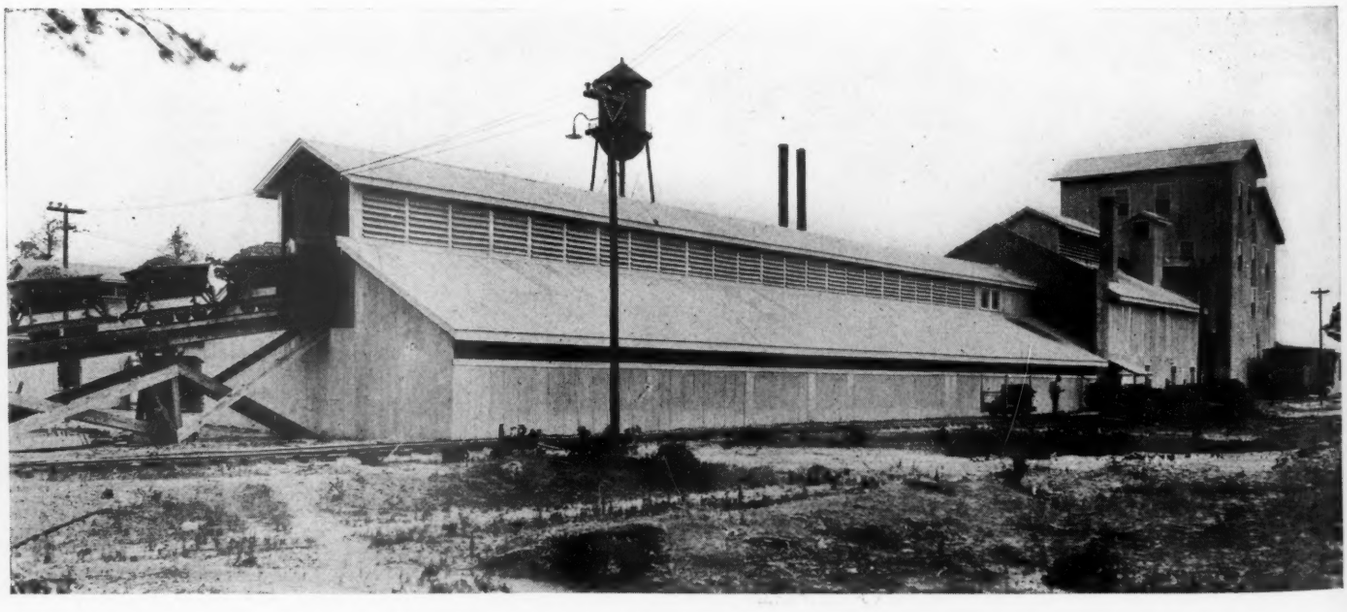
Plant Location

Riverside is located in Walker County on the south bank of the Trinity River. It is on the main line of the International-Great Northern Railroad Co., about 80 miles north of Houston, and is therefore only about 200 miles from Port Arthur. The existence of fuller's earth in this region has been known to geologists for years and a small plant was built there about seven years ago. The earth is heavier and harder than Florida clay, occurs in deposits of greater thickness and smaller extent and generally under more overburden. Five individual deposits have been definitely located on the Riverside property, which consists of several hundred acres. The mill is located about 100 yd. from the railroad, while the deposit now being mined is nearly three miles away. On account of very rough country the mill is connected to the mine by a narrow gage railroad, in which there are 10 trestles, two passing tracks and extensive mine yards.

Tractor hauling train of cars to the mill

Section of the storage shed interior

This particular deposit is roughly oval in shape, 350 ft. wide, 1150 ft. long, with an average thickness of 12 ft. of commercial earth under 8 ft. of overburden. It was originally heavily wooded and supplied several score cords of wood for fuel. Mining and stripping is by means of two ½-yd. gasoline shovels on caterpillar treads. Raw clay is hauled to the mill in 2-ton dump cars, four cars to a train, owing to heavy grades. Tractors are used for this purpose, being transformed into locomotives by means of attachments which give them a speed of 15 miles an hour in high and makes them practically "unstallable" in low. One of these units has regularly made a round trip in an hour, but the normal operating schedule is about eight trips per ten hours. At the plant the cars are hauled into the raw clay storage shed by a steam hoist installed



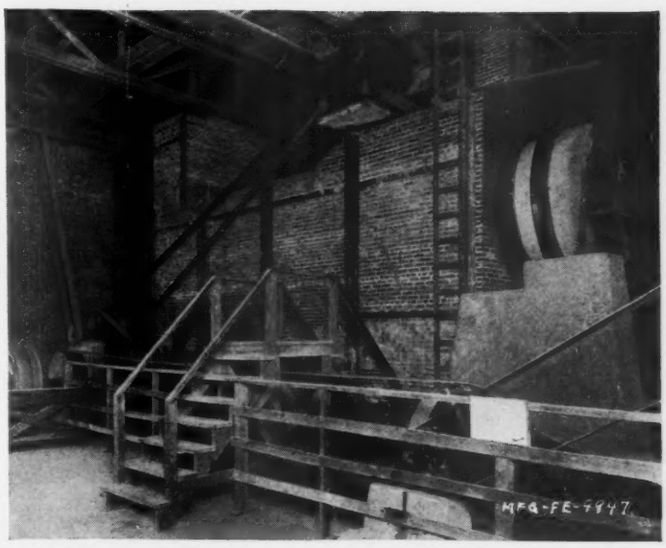
The storage shed holds about 1000 tons of raw earth

at the upper end of the inclined stock trestle.

The clay shed has storage space for about 1000 tons in order to allow the raw earth to air-dry as long as possible before being crushed and kiln-dried. The lumps are fed by hand to belt conveyors on each side of the shed and carried to a double corrugated roller crusher which reduces them to finer than ½-in. size. A chain bucket elevator delivers the crushed earth to the rotary dryer in which the moisture content is normally reduced to less than 5%. This dryer is 6 ft. in diameter, 40 ft. long, revolves about 3 r.p.m., and burns cordwood. The hot earth from the kiln is carried by another elevator to a steel cooling and storage bin which not only allows the earth to cool to handling temperature but also acts as a variable reserve between the kiln and the mill.

Screening and Crushing Equipment

In the mill proper the various screening and crushing operations are carried out. The equipment consists of a series of elevators, screens, mills, spouts and bins capable of producing any commercial grade of clay now on the market. On the fourth floor are three electric vibrating screens producing three grades of clay at one time, oversize to the coarse clay mills, sized clay to the sacking bins, tailings to the fine clay mill. There are two double roller mills on the third floor taking the oversize from the screens above and returning the milled clay to them by bucket elevators. On the second floor are the various receiving and storage bins connected by spouts to the screens and discharging through spouts to the sacking floor, below. This sacking floor is really part of the refined clay warehouse, which has a capacity of about 1000 tons of sacked clay.



Part of the kiln room showing the wood-fired rotary dryer

Battery of three electric vibrating screens, each making three separations

Bin spouts feeding to the sacking floor. Sack storage is at the left

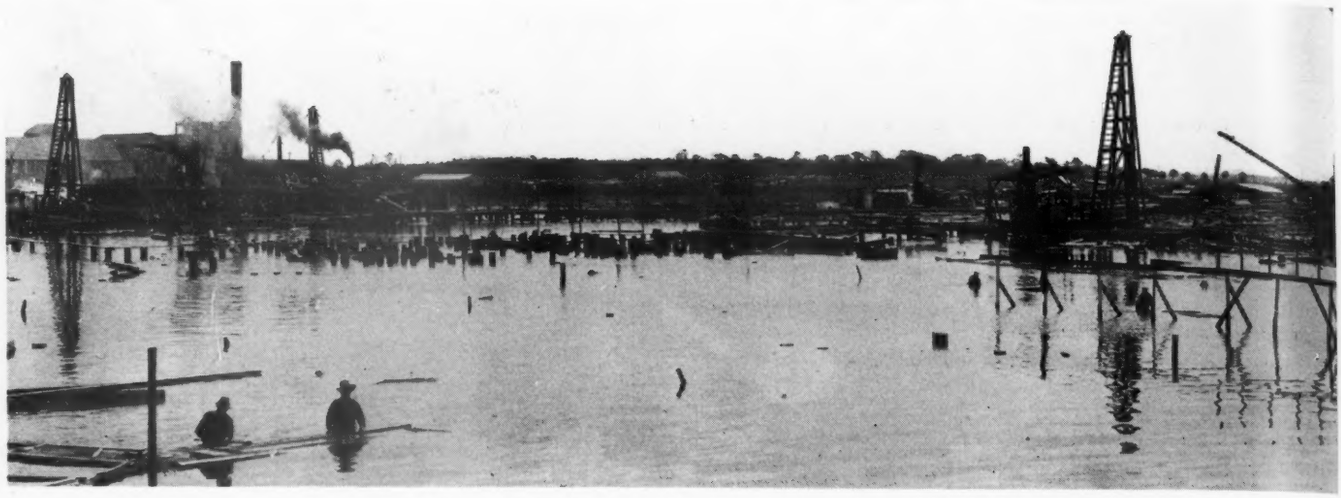
Power Plant

The plant is driven by a 225-hp. engine, so arranged that the crushing and drying equipment can be operated independently of the screening and milling equipment, and vice versa. Steam is supplied to two boilers of 125 hp., fired with lignite. Plant boiler water is supplied by a 30,000-gal. steel tank on a 75-ft. tower, into which creek water is pumped from the reservoir about a mile away.

One of the employes' cottages built and furnished by the company

Model Village

All of the mill buildings and accessory buildings, with the exception of the office, have concrete foundations with wood framing and galvanized corrugated iron walls and roofs. Four modern cottages for employes were built and furnished with their own water supply from a dug well. The plant is about a mile and a quarter from the town of Riverside, where practically all employes live. On the present operating basis there are about 20 men to produce about 1000 tons per month of crushed, screened and sacked fuller's earth.



More than 21,000 piles were driven for the foundations of this plant. The men had to work standing in the water and they went to work and quit with the changes of the tide

Florida Portland Cement Company Builds First Plant in the State

Unusual Foundation Difficulties Overcome—Plant a Fine Example of Modern Practice in Cement Making Combined with the Generation of Power

THE 5000 bbl. plant of the Florida Portland Cement Co. is not only one of the notable plants of 1927; it is one of the most notable that have been built at any time. The great difficulties met and overcome in its construction make it so, if there were not other features new and important.

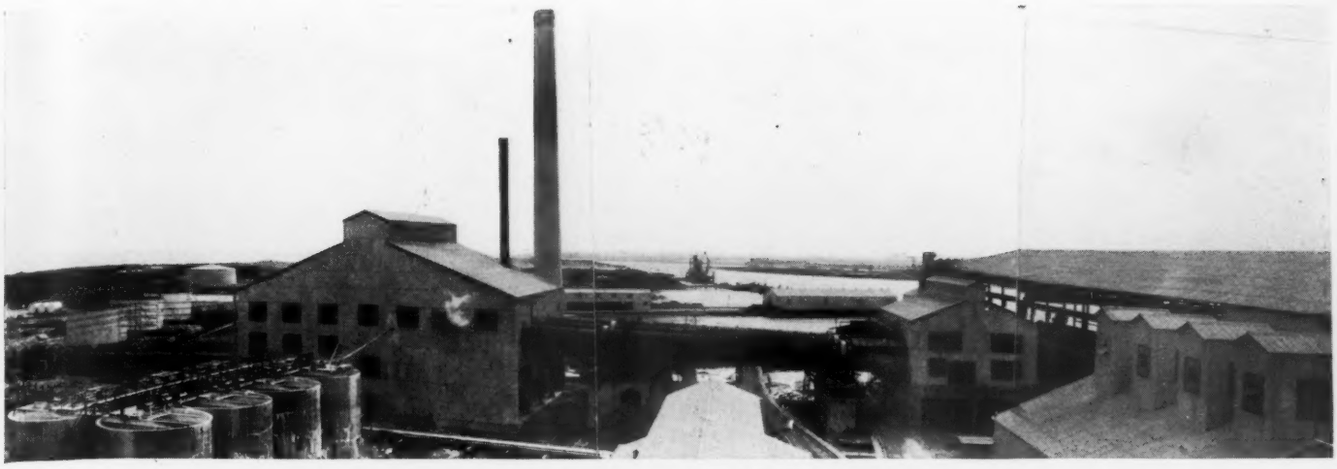
It is built at Hooker's Point, four miles from Tampa, Fla., and on the deep water channel through which the navigation of Tampa Bay passes. Every possible site was considered, but on all that were obtainable it was found that an equal amount of pile driving and filling had to be done. For a time the alternative of building the plant away from Tampa altogether was considered, as an excellent site could have been obtained near the quarry. But the reasons which have induced most of the builders of new plants to seek a site near a large center of population prevailed in this case. There was, in fact, an added reason, in that water transportation is more important in Florida than in most states, since so many of the larger cities of the states are port towns. The plant has an excellent dock all ready.

Tampa is a city of 100,000, and, as its inhabitants are always ready to tell you, it is an industrial and manufacturing town and not a resort. The Florida Portland plant is in the center of a new industrial district, much of which has been reclaimed from the bay. In most cases it was enough to pump in sand from the bay and to drive a few piles to support the heavier structures. In the case of the cement plant it was necessary to do much more, on account of the great weights to be carried. Altogether a total of 21,000 piles were driven, and on top of these was placed a concrete slab that is practically continuous under all the structures. Great beams were built in parts of it, and by these and in other ways the piles were tied together so that there could be no danger of lateral motion. Sealing against the entrance of water from below had to be provided for to protect reinforcing steel.

The plant seen from the land side. Power house at left, grinding departments in the center and pack house and silos at right

Part of the foundation is on ground that is 7 ft. under water, but on much of the site the men could work by standing in water up to their waists. To reach as much of the site as possible without resorting to boats, work was carried on with the tides. Men went to work at whatever hour the tide permitted and stayed with the job until the rising water drove them away.

Tests showed that a load of 16 tons per pile could be safely used, and that this would give a reasonable factor of safety. The piles were driven an average depth of 35 ft., passing through mud, a stratum of hard sand and finally entering coral rock, soft enough, however, to be penetrated by a pile. After the piles were driven, sand and mud were pumped in from the bay to fill between them, but leaving the ends exposed. About 6 in. below the top, pieces of scantling were



Panorama of the plant as seen from the top of the silos

scabbed on to the piles, and on these was laid a deck of 1-in. pine. On this the first concrete slab was laid and the mix was made extra rich and in other ways made as nearly watertight as could be reasonably done. This slab is above ordinary water levels, but the danger of an extra high tide, or the piling up of water by the wind had to be taken into account, or water might work up through this slab to the reinforcing above.

Ample reinforcing was placed above this first slab and then the second slab was poured. Joints were made with keys in the concrete and keys were made in the joining of the columns and walls with the upper slab. Expansion joints were used in the walls and columns, but not in the slabs, for it was figured that the water would be so nearly at a constant temperature that these would not be needed. Piling were driven thicker under the storage silos and under the kiln supports and special means were used with these to insure that there would be no side movement.

The plant was a year in building and has been built for something over a month now. During this time the foundations have been checked for settlement (every 15 days, in the case of the silos) and no movement has been noted so far, which says much for the engineering methods and skill that went into the work. The piles were driven under contract with the Foundation Co., but all the rest of the work was done by the Cowham Engineering Co. The whole design, including the waste heat boiler power plant, was the work of F. E. Dodge, chief engineer of the company. The slip form work was contracted to the Folwell-Ahrskog Co. of Chicago. The waste-heat power plant equipment is largely of Allis-Chalmers design.

Looking south from the center of the plant. Machine shop at left, kilns in center, grinding departments at right

Raw Materials

The main raw material used is the Tampa limestone which is quarried near Brooksville, Fla., about 50 miles by rail from the plant. The Tampa limestone should be familiar to ROCK PRODUCTS readers from the number of descriptions of crushed stone operations working in it that have been published. Briefly, it is made up of boulder-like masses of a fairly hard limestone in a matrix which is called "lime clay," and the name is sufficiently descriptive. An average analysis of the whole is:

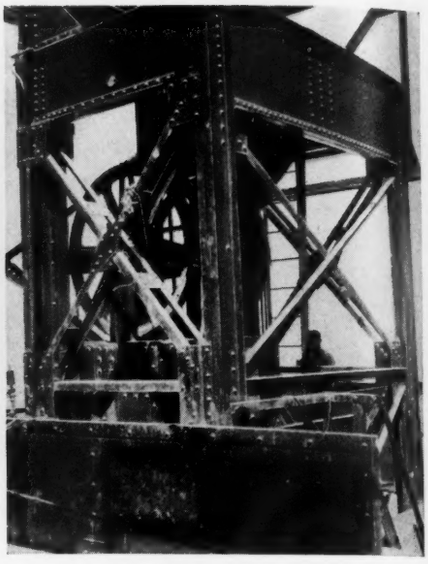
SiO_2	7.0%
Fe_2O_3	0.7%
Al_2O_3	3.5%
CaO	48.4%
MgO	0.5%
Loss on ignition	38.7%

The stone is quarried by the usual well drill and steam shovel methods, but the quarry was opened quite differently from the crushed stone quarries in the same locality. These are pit quarries, with inclines to the hoisting plant. Instead of being opened as a pit, the cement rock quarry was opened by a long line of holes, beginning at the edge of the property. When the development is complete, the quarry will have a face 40 ft. high and a mile long or more.

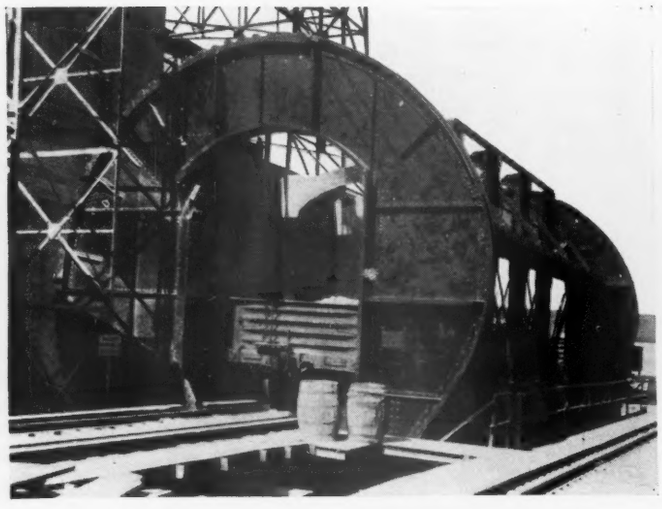
The standard gage track, on which the

Looking north from center of plant. Raw grind and crushing plant at left, warehouse and pack house at right

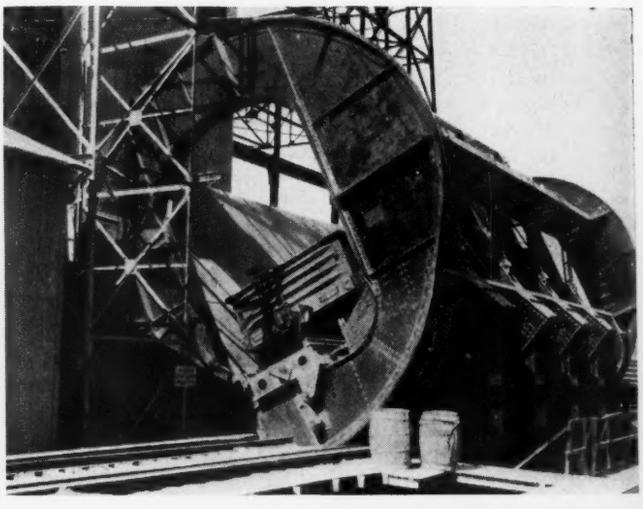
Railroad to the quarry which was opened in ground like that shown in the picture The limerock is of hard masses in a matrix of lime clay



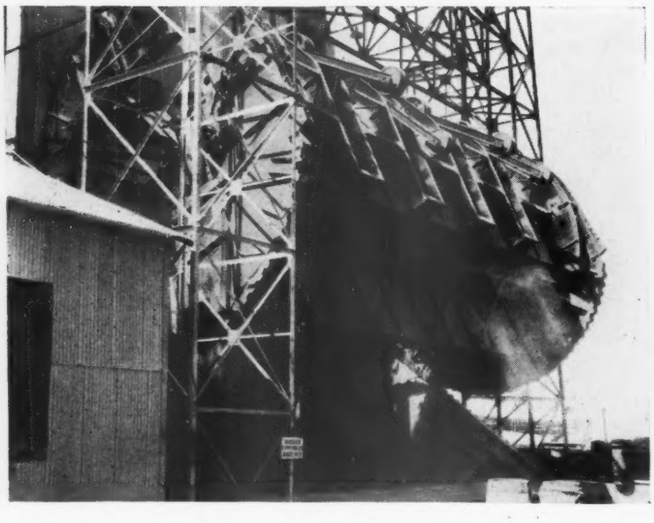
Sheaves and counterweight at top of the steel tower



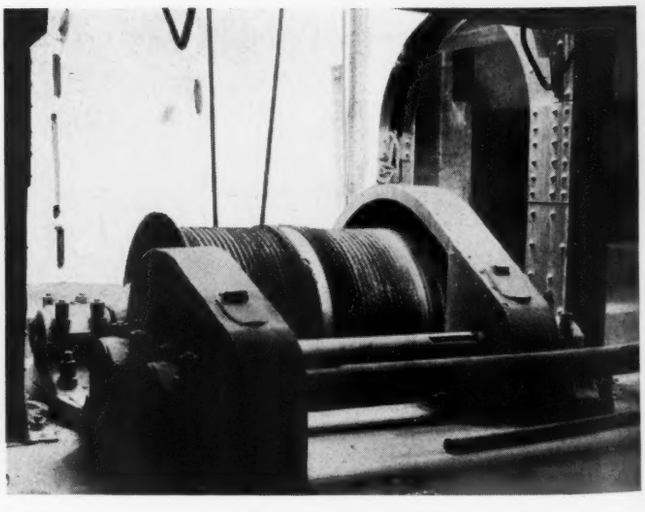
The car dump just after a car has been pushed in before the clamps have come down



Beginning to roll. Note that the section of track has slid to one side and the clamps are down



The dumper discharging. The links that operate the clamps show in front

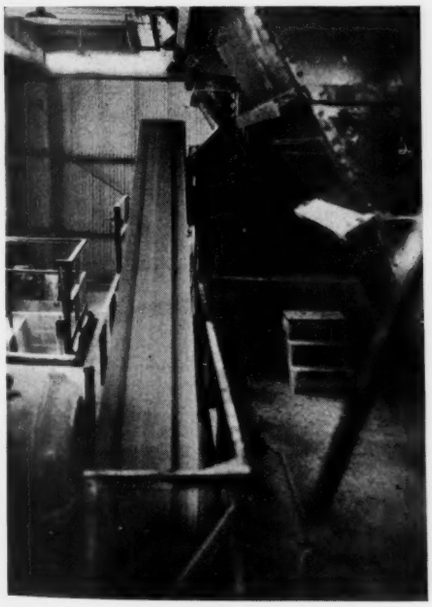


One of the two hoist drums. The double rope pulls the counterweight down

50-ton cars that take the rock to the plant are loaded, is run near enough to the face so that these cars may be loaded by steam shovels. There are two shovels, a No. 32 and a No. 61 Marion. Both are on caterpillar treads. A Keytsone drill is employed to put down the holes for blasting. Baldwin and American steam locomotives are used to handle the cars.

The clay comes from a deposit which was located by the company, about seven miles from the quarry. It is dug by a Marion steam shovel and loaded into standard gage cars which are handled by a 24-ton Plymouth gas locomotive. It is fairly uniform in its contents, running about 63% silica.

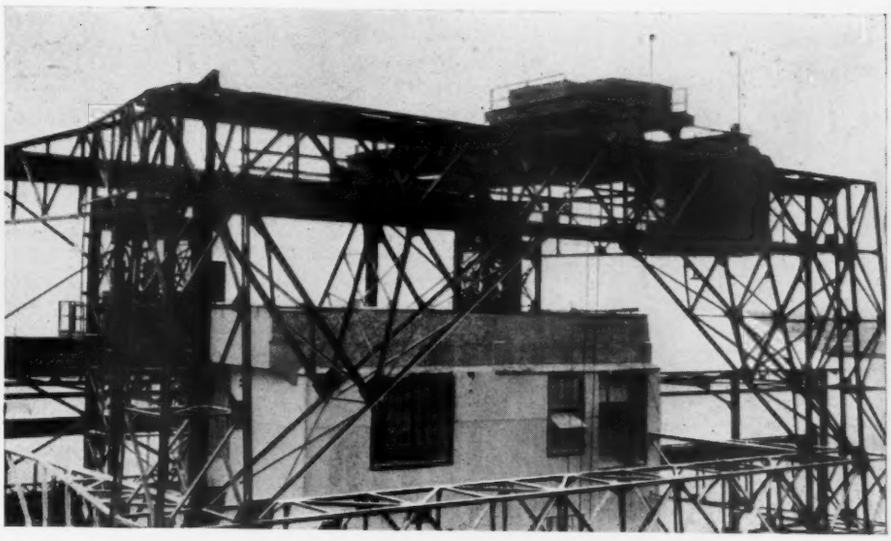
No one had ever made cement of these materials on a plant scale before, except that the Cowham company had sent some carloads to its Michigan plant to confirm by actual manufacture the results of the small scale tests. And the limestone, with its mixture of hard boulders and soft clayey matrix, is like nothing else that is used for cement raw material in this country. Consequently, provision had to be made for the worst condition in which the material might arrive at the plant. It was thought that it might be better to wash the limestone, collecting the limey mud and the water in Dorr thickeners and adding the thickened sludge to the crushed hard rock at the second compartment of the raw-grind mills. But experience has so far shown that it is not



Primary crusher and drive

necessary to wash the rock (which is the common practice in the crushing plants around Brooksville) to crush and grind it efficiently, and the thickener equipment has not had to be used. However, it may be necessary to turn to this method in times of continued wet weather, and the equipment is ready when it shall be needed.

The clay was also unknown as a cement material, and it was at first thought that it might be well to use a little kaolin with it as a corrective. Kaolin is very abundant in Florida, so it could be cheaply obtained. But experience has shown that with the excellent system of storing, correcting and feeding the clay, kaolin is not needed and its use was discontinued after a few trials.



Traveling crane over car dumper bin that lifts rock and clay 80 ft. to top of crushing house

The Unique Car Dumper

On arriving at the plant, the cars, whether they contain lime rock or clay, go to a roll-over car dumper, built by the Wellman-Seaver-Morgan Co., and this company says that it is the first of the type to be built. It is a cylinder, 50 ft. long and 30 ft. in diameter, with an opening 12 ft. 9 in. by 15 ft. to admit the car. The cylinder not only rolls over but rolls uphill at the same time, the track, which rests on concrete piers, having an angle of 35 deg. The track and the wheels at the ends of the cylinder have teeth like those of a gear and rack, and the meshing of these teeth prevent one end of the cylinder from rolling faster than the other and so running out of line. The bin into which the car is dumped is the space between the concrete piers and it holds about 1000 tons when it is heaped full.

The choice and the design of such an unusual dumper met unusual and hard conditions. Owing to the foundations, it was impossible to put a hopper below the ground level, and to bring the track in on a high line would have disorganized the plant layout. By adopting this form of dumper, the rock is placed in a bin which is not only above the ground but higher than the track, to give the needed storage; it is done in a single operation, and so well balanced is the device that comparatively little power is required to operate it.

The cylinder is rolled over and up the track by four 1⅝-in. wire cables which pass around big sheaves at the ends of the cylinder. These go to small sheaves on towers which hold counterweights running in guides. Each counterweight weighs 30,000 lb., and is a steel box filled with punchings. The towers in which these counterweights rise and fall are very strongly constructed of structural steel.

The counterweights balance the weight of the empty dumper and part of the weight of the empty car, enough weight being left unbalanced so that the weight of the car will roll the dumper back into its place when the car is empty. Under each counter weight is a hoist drum with two parts, each of which holds a cable. These cables are fastened to the bottoms of the counterweights, so that all the hoist does is to pull the counterweight down, thus giving force enough to pull the cylinder and the loaded car up the track.

The hoist drums are at the ends of a long shaft which is driven through gearing by a 125-hp. direct current motor and this motor has its own motor-generator set, switchboard and resistances. It is also provided with a hand brake, controlled by the hoist man and a solenoid brake to stop the movement of the cylinder and hold it fast in case the power should fail.

Bucket used with crane for rock and clay

Part of raw storage. Note hoppers for raw grind mills at left

When the car enters the dumper it rests on a section of track which is on a structural steel frame. This is movable sidewise, and as the dumper rolls it slides to one side, so that the car rests against bumper blocks. On the return, this section is pushed back into place, so that the track lines with the plant track, by heavy springs.

To hold the car down on the track there are heavy clamps of cast iron which come down on the car as the cylinder rolls. The movement of these clamps comes from their attachment to cables which run to links under the cylinder. A roller at the end of each link runs on a short track, and finally leaves the track so that the link hangs free, and this allows the clamp to come down. On the return, the roller striking the track makes the link tighten the cable and raise the clamp.

The whole operation of placing the car and dumping it, running out the empty and following with a full car, takes only 2 min. 25 sec., and this rate may be kept up indefinitely. The car, as in all dumpers of the rotary type, is not pulled out of the dumper but pushed on through. The empties are then gathered and sent back to the quarry on a track that goes around the dumper.

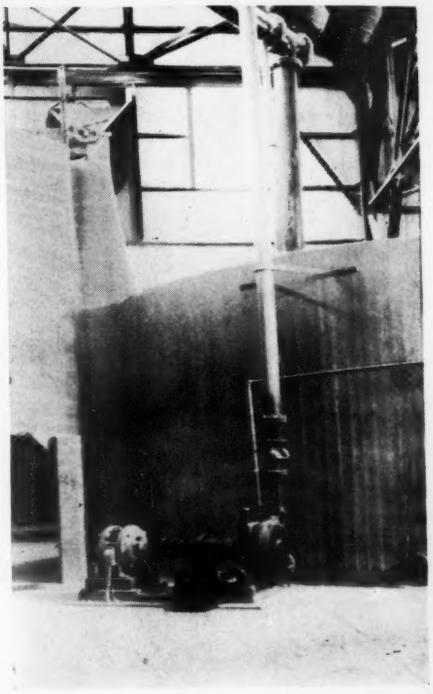
There are several safety features and interesting details about this unique machine that would require too much space to describe. But there is one that is of importance to the working of the plant and that is a safety device which prevents the dumper and the crane which takes the rock or clay from the bin from being operated at the same time.

The Crushing Plant

Owing to the heavy cost of foundations, space in this plant has been obtained by going into the air, rather than extending laterally, wherever the weight to be supported would permit. This is well illustrated in the crushing plant where the machines are placed one above the other with the feed hopper of the primary crusher at the top.

Feed is delivered to this hopper (which is 12x12 ft. in size) by a Whiting traveling crane, placed high enough so that the bucket can be raised 80 ft., the distance from the bin under the car dumper to the feed hopper. The crane has a span of 50 ft. and a travel of 75 ft. This enables it to take material from any part of the car dumper bin and deliver it to the feed hopper of the crusher or to a similar hopper connected with a chute for clay.

The bucket is unusual, for it is of the orange peel type. This was chosen because it can dig well in the soft and mucky limestone and the clay. It can also dig out all parts of the bin without any lateral motion. It is of Hayward make and its capacity is 4 yd.

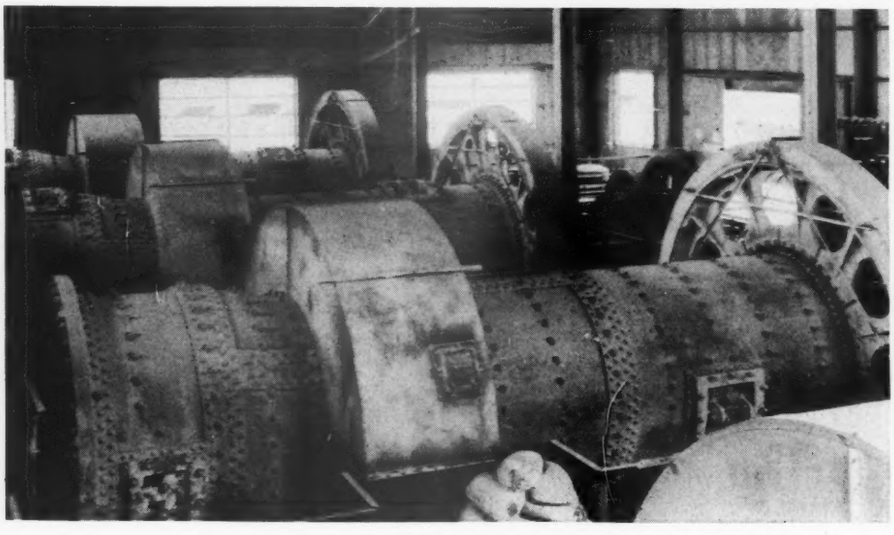


Clay storage tank and clay pump

Clay lifted by this crane is put into a chute through which it runs to the clay storage of the plant, to be afterward delivered to the wash mill by the crane over the storage.

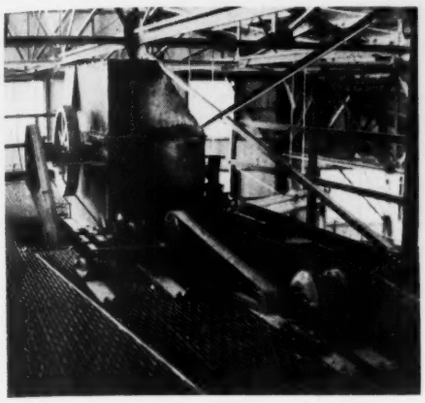
The limestone goes from the hopper to a Fairmount single roll crusher, of Allis-Chalmers make, which has a 36x60-in. roll. This machine has been found well adapted to crushing the Tampa limestone, and a number are in use in the crushing plants around Brooksville, where the rock is quarried. The drive is by a 250-hp. motor through a 20-in. belt.

All the limestone goes through the crusher



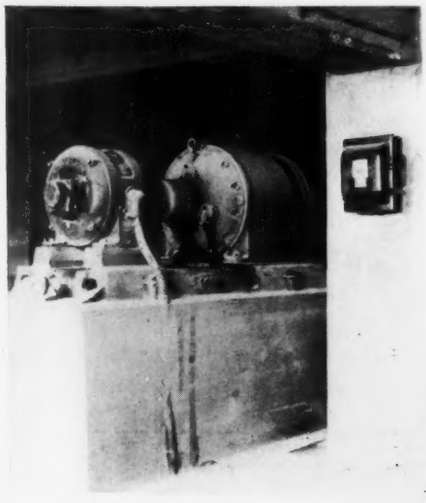
Mills in the raw grind department

and everything falls to a 72-in. revolving screen, 16 ft. long, of Allis-Chalmers make, set below it. This has sections with various sizes of holes, intended to be used with the washing arrangement, but at present it makes only two sizes, splitting on about 2-in. The drive is a 25-hp. motor and silent chain.



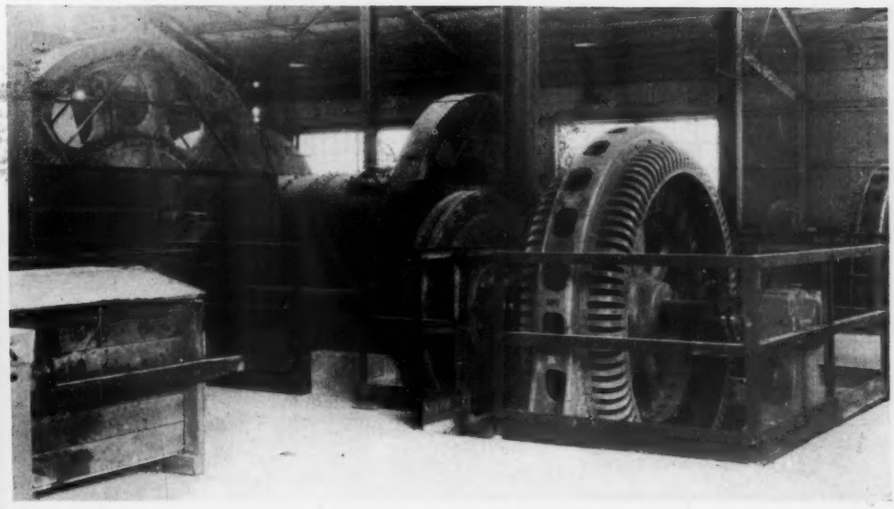
One of the clay feeders over raw grind mills

The undersize of the screen goes to the rock storage and the oversize falls directly to a Dixie Mogul crusher, No. 5050, driven by a 250-hp. motor, direct connected. This machine is a hammer mill which has been designed to crush sticky materials, and its special feature is a breaker plate, like a broad flat chain, that travels slowly and is scraped free from any adhering material as it moves. A 10-hp. motor and a Jones speed reducer drive this breaker plate, but it needs to be run only when the rock is very wet.



Drive of ribbon conveyor for raw grind mills

The discharge of this mill goes to the rock storage, along with the undersize of the screen. The whole is reduced to 2-in. and finer, and by far the greater part of it is finer than ¼-in. It is taken from the storage by one of the plant cranes and sent to the raw grind mills.



Typical arrangement of mill and motor. The pocket under the motor is ventilated with air from outside the building

Storages and the Raw Grind Department

The rock storage is in the long storage house, which is the principal structure of the plant. It consists of concrete walls, 40 ft. high, on top of which are the steel bents that support the tracks for the two traveling cranes. The various plant units, the raw grind and finish grind departments, and the kilns and coolers, join this storage house at right angles. This brings them where they can be served by the cranes with the least motion. The layout of the plant is the same that the Cowham system has used with others of its plants, notably the Signal Mountain plant, near Chattanooga, Tenn.

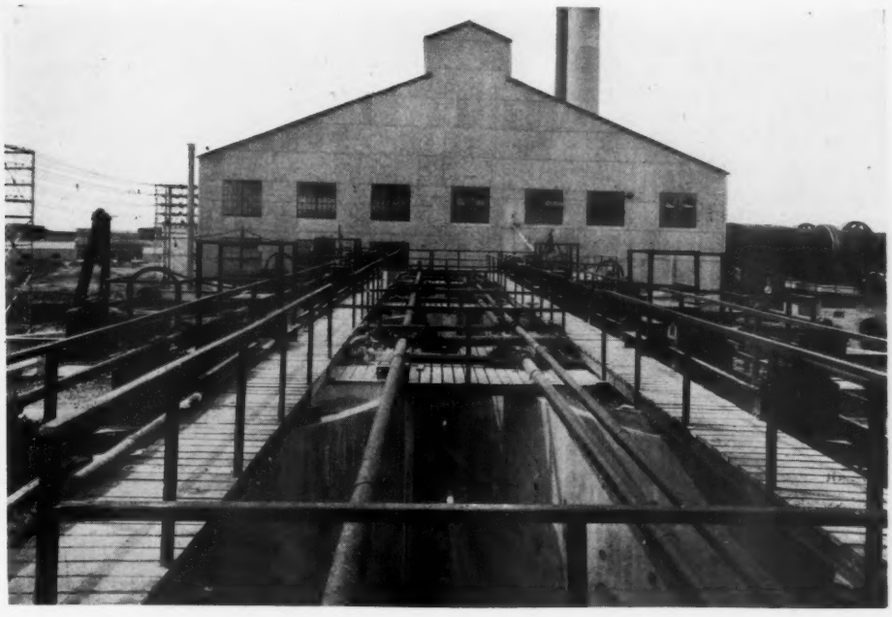
The storage house is 800 ft. long, and the width at the centers of the crane tracks is 80 ft. Two Whiting 2½-yd. traveling cranes on the track, one at the raw material end and one at the clinker end. Both have 2½-yd. Hayward buckets. The length of the various storages are:

Limerock	250 ft.
Clay	100 ft.
Coal	150 ft.
Clinker	300 ft.

A compartment 50x50 ft. is cut out of the clinker storage space to hold gypsum.

The raw grind department is in a building about 150x100 ft., which also contains the clay wash mill. It contains four Allis-Chalmers compeb, two compartment mills, and the feed hoppers of these mills are under the crane track of the storage house, where they can be easily filled by the crane. The feeders below these hoppers are Stephens-Adamson apron feeders, driven by 3-hp. motors through gear reductions. Each hopper holds about 75 tons.

The compeb mills are 27 ft. long. The diameter is 8 ft. for the first 3½ ft. of length and 7 ft. for the remainder. Chrome steel balls, from 5 in. down to 2 in., are used in the first compartment and concavex



Looking over the tops of the slurry tanks toward the kilns and power house

Airplane view of plant showing the site on the water front and the city of Tampa, about a mile away, in the background

balls in the other compartment. The mills are driven by 550-hp. Allis-Chalmers synchronous motors through Cutler-Hammer magnetic clutches.

The motors, as is the usual way, are set in pockets in the concrete floor, and in making these O. A. Hartley, the plant superintendent, introduced a new feature by making openings for ventilation and putting in ducts to bring in air from the outside, to insure good cooling.

Clay is put into the first compartment of the mill by Allis-Chalmers feeders of the Ferris wheel type with Reeves cone pulley speed regulator, the same machine that is used in feeding slurry to kilns. The clay is prepared in an Allis-Chalmers 26-ft. wash mill of the usual type, driven by a 75-hp. motor and Tex-rope drive. The wash mill is concrete but it is lined with vitrified brick, and the column that supports the drags is covered with the same material.

From the wash mill the clay goes to the clay storage tank, which is 30 ft. in diameter and 16 ft. deep. This is fitted with the same kind of agitating gear that is used on the slurry tanks, driven, in this case, by a 7½-hp. motor through a Jones speed reducer.

The clay is pumped to the feeders by a Wilfley 4-in. centrifugal pump, direct connected to a 30-hp. motor. The clay, as delivered to the feeders, contains about 65% of moisture, and only a little water has to be added to make a workable slurry at the mills. As is the usual case with the soft limestones of the Gulf Coast States, the moisture content has to be kept somewhat higher than with hard limestones, although not so high as with some of the Texas and Alabama chalks. At present the moisture content is 40%, but it is expected that this will be decreased somewhat.

The slurry falls from the mills into a concrete pit, in which there is a 20-in. ribbon conveyor, running under all the mills. It is driven by a 15-hp. motor through a Jones speed reducer and flexible coupling. This delivers the slurry to two 4-in. Wilfley pumps, driven by 40-hp. direct connected motors, which pump it to the slurry tanks.

Raw grinding is carried to about 90% through 200-mesh and the material is such that a high output comes from the mills at this fineness.

Slurry Department and Kilns

There are eight slurry tanks, set in two lines of four. The pair nearest the kilns are used for feed tanks, the others for correction and storage. Both air and mechanical agitation is used. The air agitator is very simple, as it is only a vertical pipe, perforated with holes near the lower end, which is placed near the center shaft of the mechanical agitator. This shaft carries a pair of plain sweeps which are set almost at the bottom of the tank.

Each line of four tanks has a shaft above it from which all the agitators in the line are driven by chains and sprockets. The drives of these shafts are 40-hp. motors working through Jones spur gear reducers.

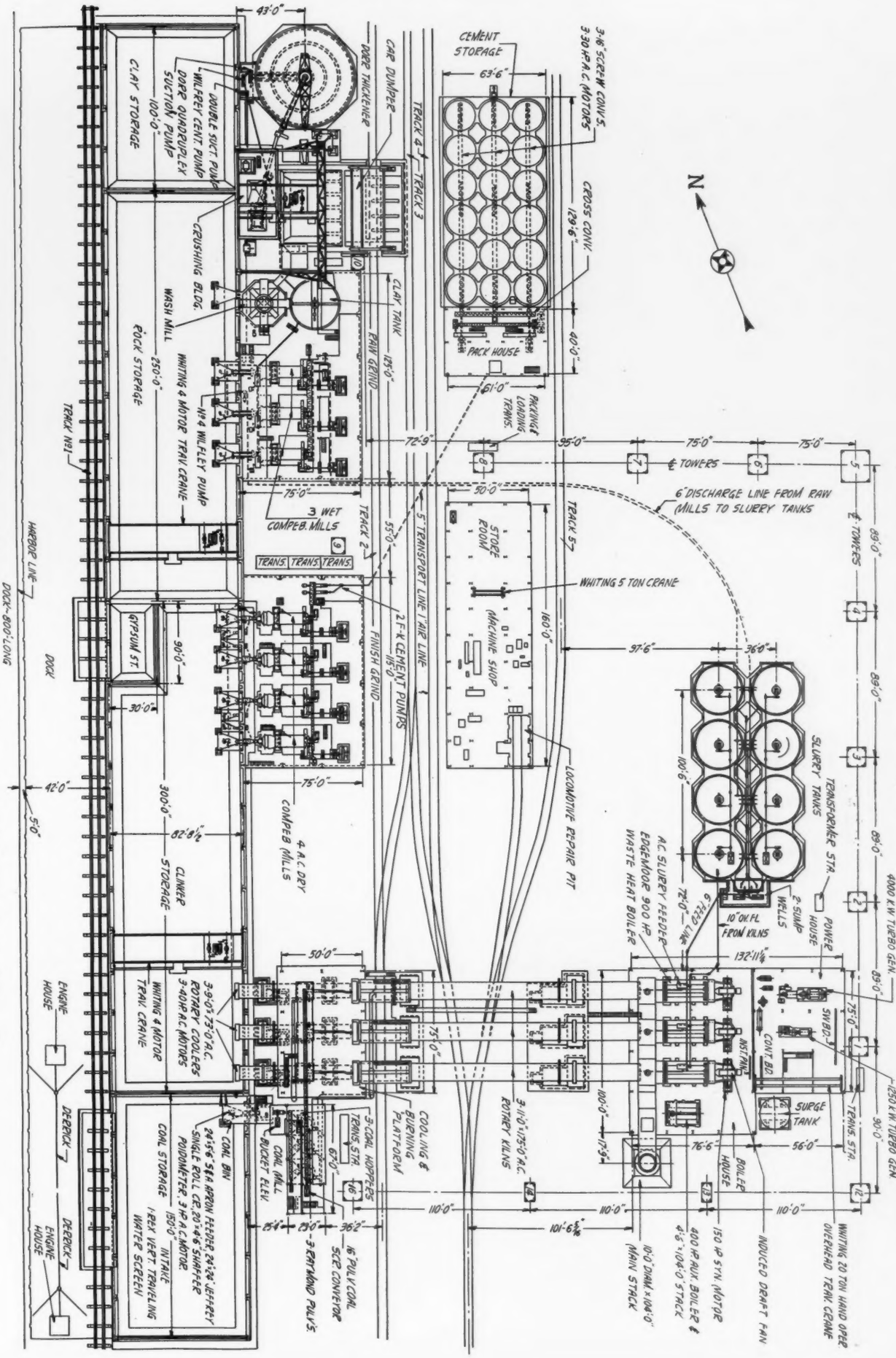
Feed tanks are emptied alternately, the corrected slurry in them being pumped to the kiln feeders by two 4-in. Wilfley pumps driven by 40-hp. motors. One of these pumps is able to do the work; the other is held as a spare.

The kiln feeders are of the Ferris wheel type and are just like those that are used for feeding clay to the mills. They are driven by 3-hp. motors and have the Reeves cone pulley speed regulators for regulation.

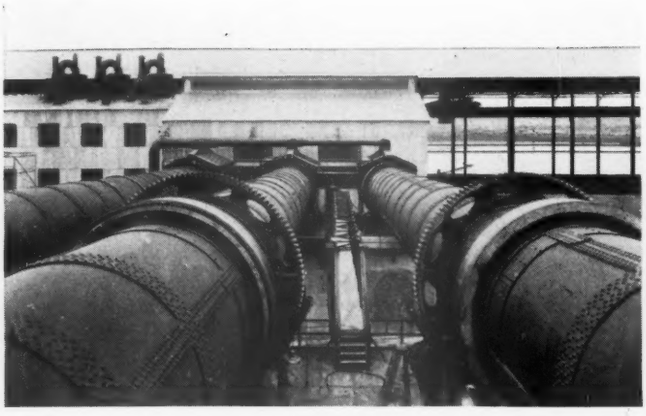
The three kilns are of Allis-Chalmers make and are 175 ft. long and 11 ft. in diameter. These seem short as compared with some of the newer installations, but they are the length adapted to the use of waste heat boilers. The drive is by a new type of motor, and this is said to be the first installation on a kiln. Both rotor and stator of this motor have two windings, and eight changes of speed may be made, running from 360 to 720 r.p.m. The motors drive the kiln through trains of cut steel gears and the high speed shafts of these trains have Timken roller bearings.

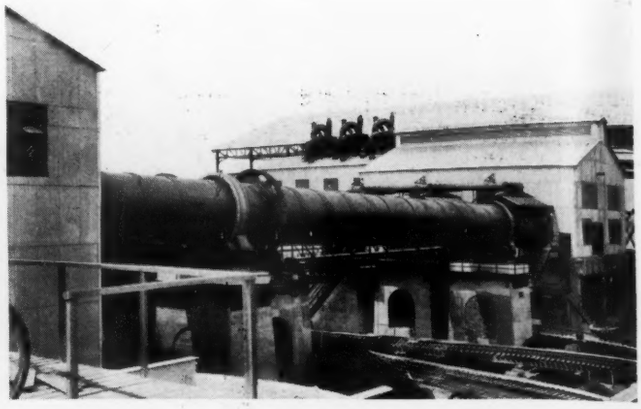
Mounting these kilns was naturally one of the most important parts of the work of putting in the foundations. Extra piles were driven where the kilns were to go and the upper of the two concrete slabs on the piles was carried up into a beam about 3 ft. thick under each kiln. This is heavily reinforced, the purpose being to insure stability, since a live as well as a heavy load has to be carried. The columns holding the kiln are joined to this beam with keyed expansion joints.

The burning zone in all three kilns is lined with high alumina refractory brick, but a different make in each. Several dif-



Plan and machinery layout of the new plant of the Florida Portland Cement Co. at Tampa, Fla.





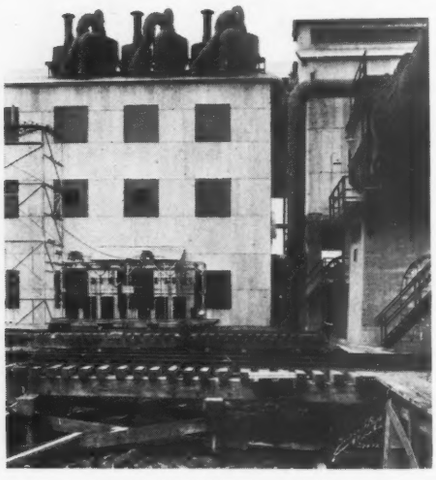
Two views of the kilns. Note the hoods and pipes at the end for collecting heated air which is used in the coal mills to dry the coal as it is ground

ferent kinds of these refractories were bought with the intention of trying out all of them to determine the kind which was best adapted to the material.

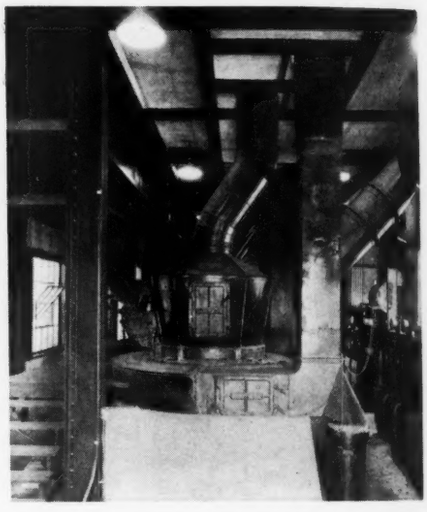
The hot clinker falls from the kilns into chambers, 3 ft. 9 in. long and 12 ft. 3 in. wide, inside the firebrick lining. From this chamber it flows through chutes of Strennes metal, which are somewhat spiraled to check the rate of flow, and then falls into the coolers. The coolers are 73 ft. long and 9 ft. in diameter and they have heavy cast lifters in the first 16 ft. which are 8 in. wide and set at 45 deg. with the flow. Each cooler is driven by a 40-hp. motor, of the same type that drives the kilns, and a train of cut steel gears.

No conveyor or elevator is used with these coolers; they are set at a low point in the wall of the clinker storage, and the clinker falls about 9 ft. when the space below is empty. It is then picked up and distributed by the crane.

All the air that enters the kilns is drawn through the coolers by the natural draft and by the fan behind the boilers.



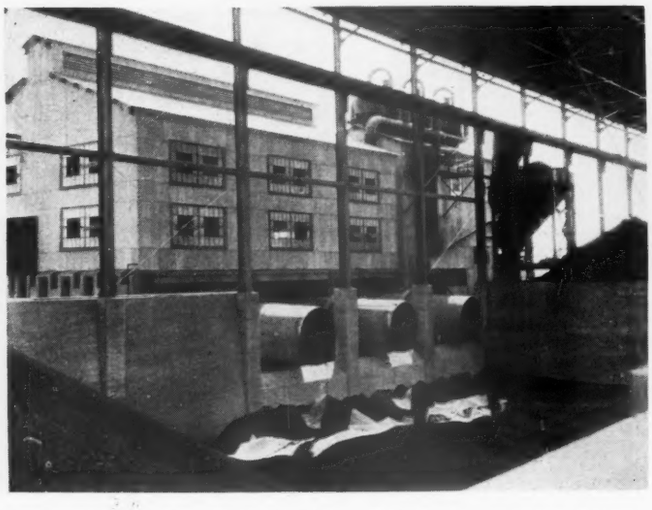
Coal mill. Note air separators projecting through the roof



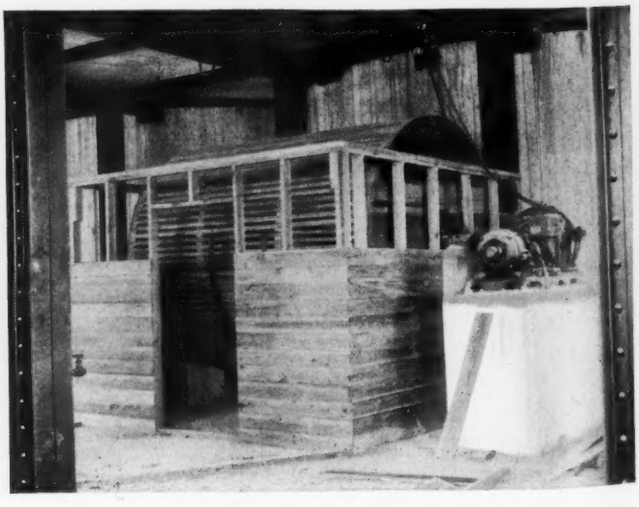
Interior of coal mill. The inclined pipe at the right brings in heated air from kilns and coolers

Coal Mill

The coal mill is considered one of the show places of the plant, and it is very well arranged and kept free from dust and dirt. In pulverizing the coal, the new system which was recently introduced by the Raymond company is employed. This system grinds the coal in a stream of heated air so that drying and grinding are carried on together. The heat is radiant heat from the kilns and coolers which is collected at no additional expense.



The three coolers discharge directly into the clinker storage

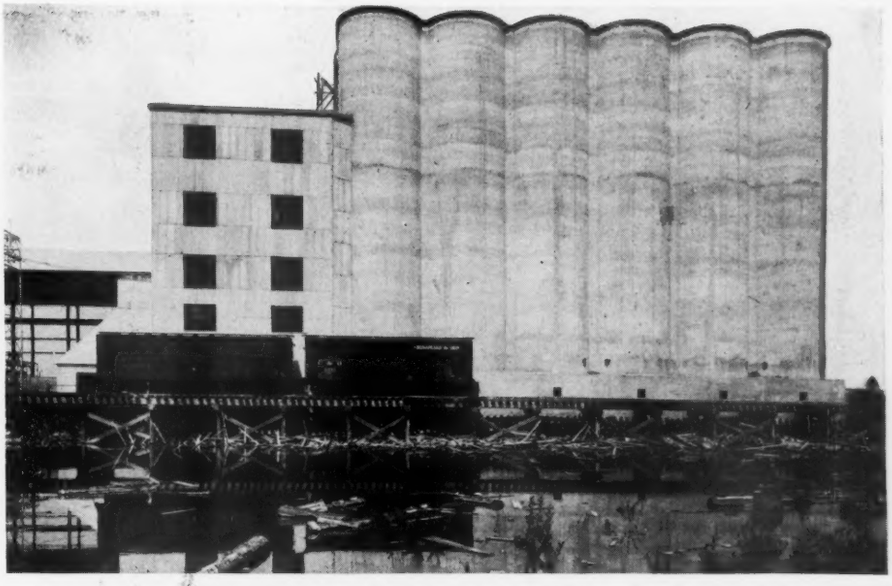


Sack cleaner in pack house (under construction)

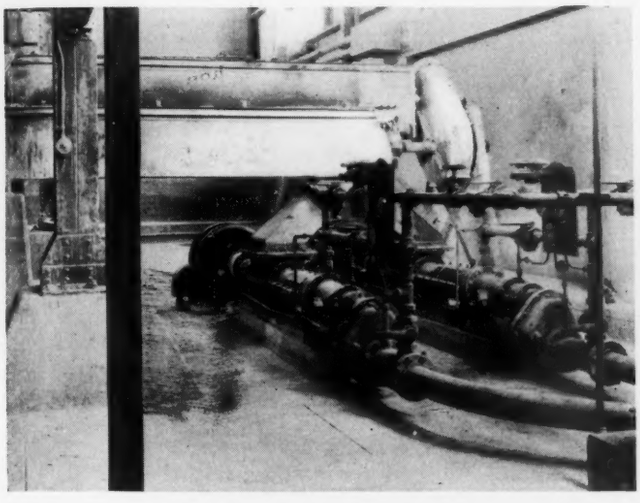
Coal is brought to the mill from the coal storage by the crane and placed in a 50-ton hopper over the Jeffrey coal crusher, which reduces it to about 1-in. size. The crusher is driven by a 25-hp. motor, direct connected. From the crusher the coal falls on a 20-in. conveyor 6 ft. long connected to a Shaffer poidometer and a Dings magnetic pulley. The latter pulls out a surprising amount of tramp iron. On the day the plant was visited it took out a piece of a car spring, which would certainly have been a bad thing to put in a mill.

This belt discharges to the boot of a Chain Belt elevator, enclosed in a steel housing, with buckets 8 by 16 in. and 43 ft. between pulley centers. From this the coal falls on a 16-in. screw conveyor which distributes it to the hoppers of the three coal mills. The hoppers are 8 by 15 ft. on top and 18 ft. deep and hold about 50 tons.

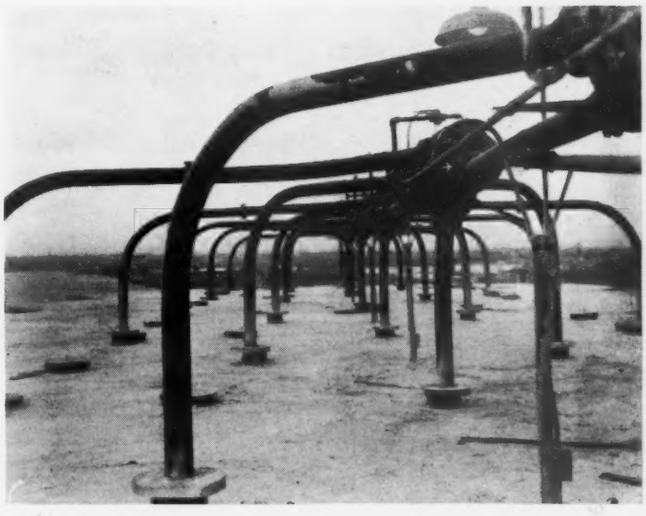
The coal is pulverized in 5-roller, low side Raymond mills having the usual



Pack house and silos. Great care had to be used in putting in the foundations for the silos. Extra piles were driven and supported so that there could be no lateral movement. Repeated checking has shown no settlement

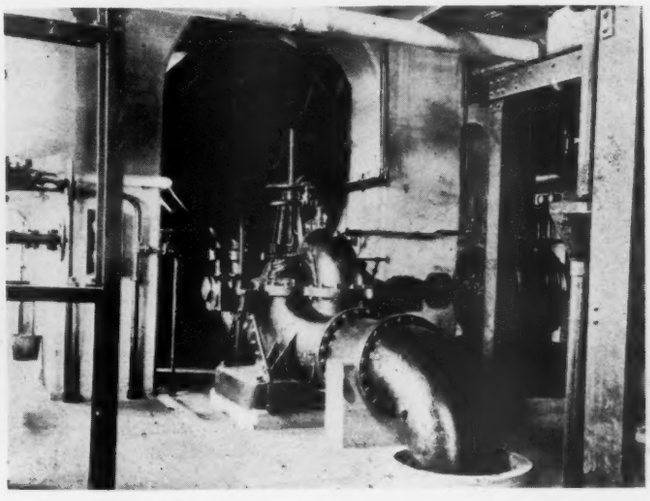


Cement pumps which send the cement through a 380-ft. line to the silos. The rise is 107 ft.

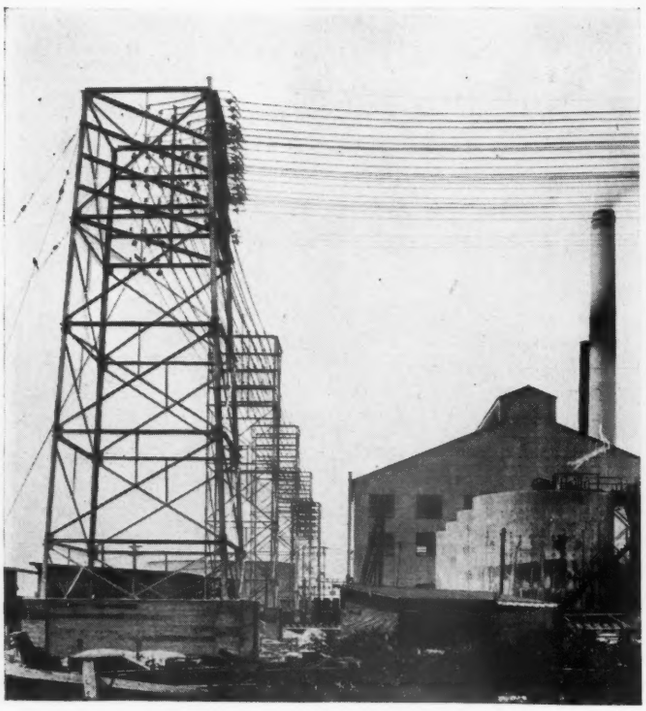


Pipes and valves on top of silos, one of the few such installations that are placed in the open

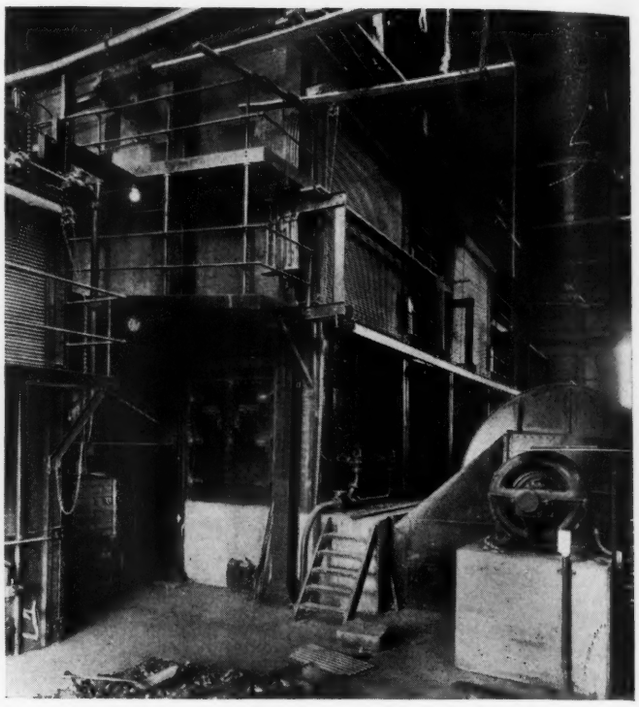
Fan, fan drive and dust collectors in the pack house, which collect dust from parts of the building as well as from the packing machinery



One of the two condensers and condenser pumps. Each pump has a 20-in. suction and 18-in. discharge and throws 9400 g.p.m. Salt water is used for condensing



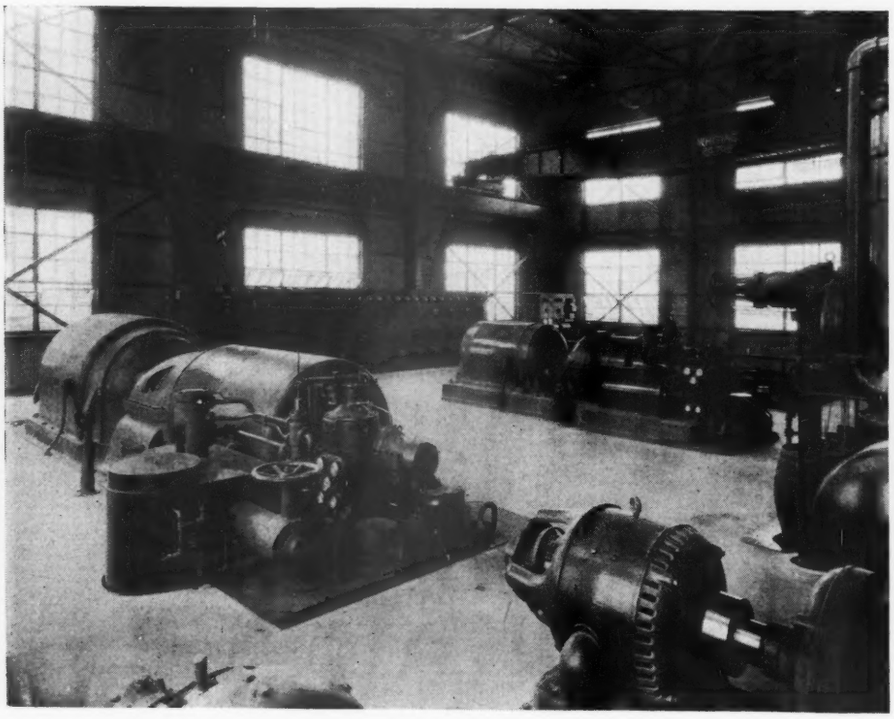
Slurry tanks and power house (at left) and steel towers for transmission lines



Interior of boiler house showing waste heat boilers and one of the fans

ratchet feeders. The heated air is brought into the base of the mill through a pipe that is connected to a pipe about 2 ft. in diameter that runs over all the mills, connected to the hoods placed over the hottest parts of the kilns and the coolers. The hoods over the kilns show quite plainly in some of the pictures with this.

The fan which draws in the heated air is the regular fan that is used with the air separation system of the Raymond mill, and there is practically no change in the grinding and separation practice, although the capacity of the mill has been greatly increased since the heated air was introduced. Each mill is driven by a 75-hp. motor and each fan by a 40-hp. motor direct-connected to the fan.



Interior of power house showing 4000-kw. and 1200-kw. turbo-generators and the main switchboard

A screw conveyor 117 ft. long takes the pulverized coal to the burner hoppers at the kiln, from which it is fed to the kilns by screw feeders of Stephens-Adamson make. These are driven by small motors through a Reeves cone pulley speed regulator. Before going to the burner pipe it passes through an air and coal mixer of special design intended to prevent flooding. There is also a vertical pipe, open at the top, attached above the screw feeder, which has the same function. The fan by which the coal is blown into the kiln is of Buffalo Forge Co.'s make and it delivers 7500 cu. ft. of air per minute. It is driven by a 40-hp. motor.

Finish Grinding and Packing Departments

The finish grind mills are in a building about the same size and shape as that which houses the raw grind mills. The four compeb mills it contains (26 ft. long and 7 and 8 ft. in diameter) are precisely like those in the raw grind department which have already been described. The motor equipment is also the same. Concavex balls are used as a grinding medium.

The cement falls from these mills to a 20-in. screw conveyor, 100 ft. long, which is driven by a 15-hp. motor and Jones speed reducer. This delivers to a short screw conveyor that feeds two 6-in. Fuller-Kinyon pumps, placed in a pit at the end of the grinding department. Each is driven by a 100-hp. motor. The distance to the first silo of the packhouse, to which these pumps deliver, is 180 ft., to

which must be added about 200 ft. for delivery to the farthest silo. The rise in the pipe is 107 ft.

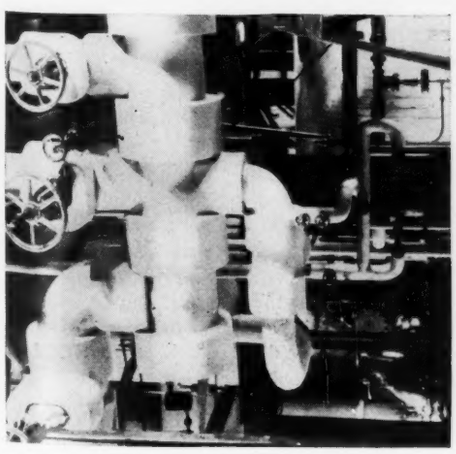
The silos are 20 ft., inside diameter, and 85 ft. high. They will hold 120,000 bbl., with the intersticial bins between the silos. This is a rather smaller storage than some modern plants have installed in proportion to the production, but there is not the necessity for a large storage in Florida that there is in some other parts of the country. The work of building and highway construction goes on all through the year, instead of being seasonal with well marked peaks that require large storages. It may also be noted that this plant has a rather large finish grind capacity in proportion to its production.

The recovery of cement from the silos is by three 16-in. screw conveyors 117 ft. long, driven by 30-hp. motors and Jones speed reducers. They deliver to a cross-conveyor 48 ft. long driven by a 10-hp. motor and Jones speed reducer. This screw has right and left hand flights, 24 ft. of each on both sides so as to deliver the cement at the center. At this point the cement falls into the boot of a steel-enclosed elevator with 16-in. buckets and of 43-ft. centers, which was made by the Weller Manufacturing Co. It is driven by a 10-hp. motor and a Jones reducer.

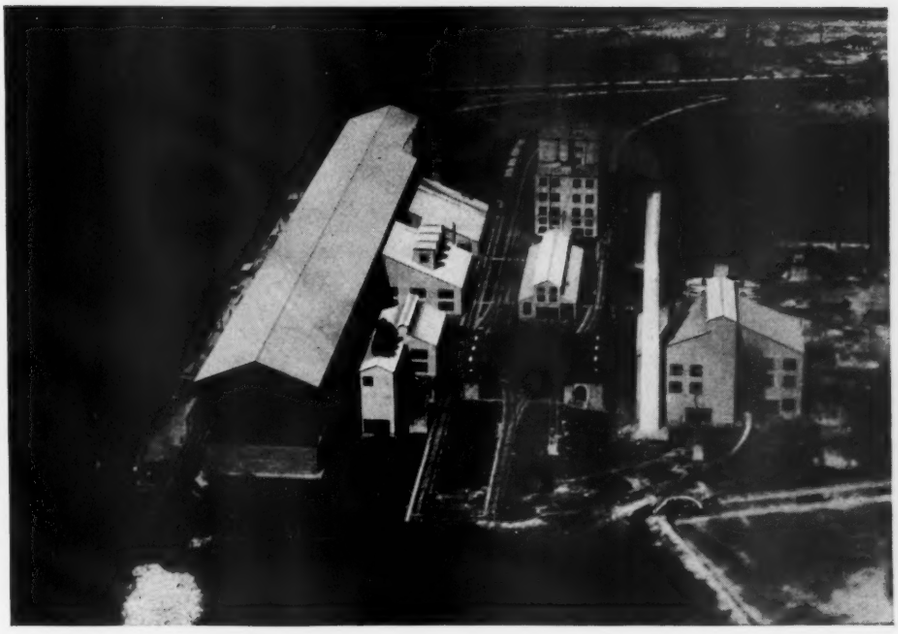
The elevator has a double spout on the discharge by which it feeds the packer bins on either side. There are five Bates packers, all of the 4-valve type, and there is the usual system of belts and dust screws to take care of the sacks and any cement that is spilled on the floor.

Dust collection is taken care of in the pack house by a Sly dust collector, fed by an American blower fan driven by a 40-hp. motor.

At present (this was written when the plant had not been in operation more than a month) all the cement is packed for railroad shipment. But it is intended to add small pack houses, or to put in sack storage arrangements, for delivery to trucks and also to vessels lying at the plant dock.



Detail of pipe covering in the power house



Airplane view which shows the 800-ft. storage house with the kilns, finish grind and raw grind departments set at right angles to it

Two Chicago Pneumatic compressors, driven by 125-hp. motors, supply air for the Fuller-Kinyon pumps and for agitating the slurry. They are placed in the power house.

Waste Heat Power Plant

The power plant, utilizing waste heat from the kilns, is one of the most complete and modern installations of the kind that has been made. It was designed by the engineering staff of the Cowham Engineering Co., but the electrical and auxiliary equipment except the switchboard was furnished by the Allis-Chalmers company, which also furnished the motors and other electrical equipment throughout the plant for controlling the motors. The power plant is worthy of a complete story in itself, but space here can hardly be spared for more than an enumeration of the various machines and instruments.

The three boilers are of Edge Moor make, of the four-pass type. Each has 350 Shelby seamless tubes, of No. 9 gage, 24 ft. long. The hot gases from the kilns are drawn through the boilers by "Green Fuel" fans of a new design, which are of the paddle type and have a double inlet. Each fan is driven by a 150-hp. motor and has water-cooled bearings. After passing the fans the gases go to a Foster fuel economizer, which is 8 tubes long and 14 tubes high.

Steam is used with about 100 deg. F. superheat which comes from passing it through a Foster superheater, placed above the tubes of the first and second passes of the boiler.

The water heater is of the Griscom-Russell de-aerating type, which not only heats the water but removes the dissolved air to prevent oxidation of the tubes and pipes.

Steam flows from the boilers to two Allis-Chalmers, Parsons type, turbo-generators. One of these is of 4000 kw. capacity, the other of 1250 kw. The larger turbine was designed for 5000 kw. at unity power factor. The ordinary power factor used at present is about 85%. The cooling is by the passage of the same water through a Griscom-Russell cooler, and the lubrication of the bearings is by a circulation of oil which passes through a Phoenix-Richardson oil filter and cooler. Thermometers placed on the entrance and exhaust side of the steam flow give the temperature of the steam before and after it has done its work.

There are two exciters for the turbines, one of 60 kw. (480 amp. and 125 v.) which is driven by a 75-hp. motor, and which is regularly used, and a second of the same type driven by an Allis-Chalmers impulse type steam turbine. This is used in starting, before current for a motor is available.

After passing the turbines the steam flows to two Allis-Chalmers condensers, with Richardson evactors. Water for condensation is supplied by two Allis-Chalmers pumps, with 20-in. suction and 18-in. discharge, each delivering 9400 g.p.m.

Salt water is used in the condensers, taken from the bay in front of the plant. The intake is a fine piece of construction, as it is all of concrete and carried about 20 ft. below the water level. The entrance of the water is guarded by a traveling screen, and there is a large gate to shut off the water from the pipe to the plant. This pipe is of concrete, 54 in. in diame-

ter and about 700 ft. long.

The feed water pumps are of Allis-Chalmers make and are four-stage centrifugals, with 2-in. discharge and 3-in. suction. Each will deliver 250 g.p.m. at 620 ft. head. One is driven by a 75-hp. motor and the other by an Allis-Chalmers impulse type steam turbine. This is used in starting the plant.

To provide steam for starting and also when two of the kilns are down, there is an auxiliary boiler which is fired with coal.

The instrument equipment is very complete. On a board in the boiler room are:

Three recording pyrometers which record the temperature of the gases leaving the kilns.

An indicating pyrometer which may be connected to show the temperature of the gas leaving any kiln and also at the first, second and fourth pass through the boiler and the temperature at the uptake of the fan.

A draft indicator showing the draft at the same points.

Three Republic steam flow meters indicating and recording the flow from each boiler.

Integrators for integrating the flow recorded as above.

Two flow meters of the same kind connected to the turbo-generators.

Integrators for the flow recorded as above.

Bristol recording thermometers showing the temperature of the steam at the superheater and of the water level at the feed water inlet and outlet.

In addition to the above there are several thermometers, not of the recording type, which are placed at points in the condensers and elsewhere throughout the installation.

A 20-ton Whiting crane, hand-operated, is placed in the roof of the turbine room. It has a 50-ft. span and can reach all the machines in this room.

Collecting Dust from Stack Gases

Installed in the power plant is one of the most interesting features of the plant, a system for collecting dust from the gases before they enter the stack. It was designed and installed by Dust Recovery, Inc., of New York.

The action of this collector is purely mechanical. Briefly explained, it embodies an arrangement of baffles and traps by which the dust is concentrated in traps, where a large number of vortices are formed, through the action of which the dust is precipitated in dead air spaces in the hopper, from whence it is continuously removed by conveyors.

The collected dust is returned to the kilns, as it is not sufficiently burned to make cement. It is of particles somewhat finer than the finished cement, a part of it passing 300 mesh. Nothing that goes into the stack is coarser than 300 mesh, and this is so fine that it is not objectionable. It blows out far over the bay and is distributed over so wide an area that there is no danger of its creating a dust nuisance.

An added advantage is that it keeps the power house free from dust. No dust has entered the power house since it was installed except a little that came through small leaks in the ducts through which the gases pass. These have since been sealed, making the plant quite dust free.

Intake for condenser water and wharf. Note the traveling screen on the intake

Notes on Electrical and Mechanical Equipment

The main switchboard, which is of General Electric design and make, is in the same room as the turbo-generators, on the upper floor of the power plant. Beside the usual switches for distributing the current to the various motor circuits, it contains instruments that have to do with the running of the generators. For each generator there is a recording watt meter and a General Electric voltage regulator. There are also thermometers which indicate the temperature of the windings of the generators.

On each of the panels connected with a motor circuit there is an ammeter and an indicating and integrating kilowatt-hour meter.

The current, generated at 2300 v., is carried to the motors and transformers in the plant by transmission lines which are supported on square steel towers. These are set high enough to provide a clearance of at least 30 ft. over all the tracks in the plant. There are five transformer stations, the largest being placed between the raw grind and finish grind mills. Current from this goes to the cranes and to smaller motors in the grinding and slurry departments. Another near the packhouse gives current to the packing and loading machinery. Two others are placed at the crushing plant and at the coal mill and one is near the power house.

Overload relays are provided to protect the line from the effect of short circuits. Several types of starting boxes and switches are installed, some of the motors being provided with across the line and magnetic switches.

One panel of the main switchboard is connected to the circuit of the power company from which the city of Tampa obtains light and power and arrangements have been made so that this can be used in an emergency, including the oil switch for making the connection.

The circuits are arranged so that all the auxiliary machinery may be operated after the mill machinery has been cut off.

Construction

Owing to the nature of the foundations, weight had to be kept down in the plant buildings as well as in other parts and the problem of doing this was happily solved by making some of them of steel framing covered with cement-asbestos siding, made by the Dorn Co. This construction is especially adapted to the climate of Florida, and the use of cement-asbestos is increasing there. Its exterior appearance is not so different from corrugated steel sheets, but the climate has no effect on it as it has on corrugated steel.

All the steel framing is carried on concrete walls which are keyed on to the slab below. The plant tracks are carried

on trestles which bring them to the height of the first floor of the buildings, the trestles being supported on piling.

The general plan is that of a capital L, the storage house making the long arm and the kilns and the power house the short arm. The grinding departments are attached to the long arm of the L and in the angle are placed the pack house and the auxiliary building, containing the storehouse of the plant and the repair shop. This last is very completely equipped for making repairs to all the machines, including the steam locomotives.

Personnel

The officers of the Florida Portland Cement Co. are: John L. Senior, president; H. A. Drum, vice-president; R. N. Cowham, secretary and treasurer. In addition to the above, the following are directors: J. L. Caldwell, J. A. Griffin, J. F. Hoskins, H. T. Lykes, W. A. Sadd, W. H. Wilcox.

The personnel of the Cowham Engineering Co., which will have active management of the Florida plant, includes: Hiram Norcross, vice-president of the Cowham Engineering Co.; T. N. Curtis, general superintendent, and F. E. Dodge, chief engineer.

O. A. Hartley is resident superintendent at Tampa and F. M. Traynor is local director of sales. C. A. McKeand has the title of assistant to the president.

S. Rordam is chief chemist and assistant to Mr. Hartley, John Kominsky is in charge of the power plant and G. Borgan is chief electrician.

Kingsport Plant of Penn-Dixie Ships 35% Daily Output in Bulk

ORDINARILY thinking of cement shipments we have in mind two kinds of packages—cloth and paper sacks—so tightly made that there will be no possibility of appreciable loss in shipping or handling on construction jobs and in warehouses. For water shipments wooden barrels were formerly used, and those plants that made such shipments usually made their own barrels in well-equipped barrel factories. Waterproof sacks are, however, rapidly replacing the wooden barrels.

During the recent years, with a more perfect understanding of the use of concrete in building large dams, bridges, etc., in the construction of which thousands of barrels of cement were used, the thought of using cement shipped in bulk presented itself and thus the standard box car began to be used in a new way, to carry loose cement to the jobs, where it is unloaded into bins. Only a few years ago it was thought impracticable to ship loose cement in cars because of the possibility of the fine powder sifting through openings in the floor and around the doors. It may be of interest to users of cement to know that the Clinchfield Portland Cement Corp. shipped loose cement in open-top cars during the late war. Each car was covered securely with large tarpaulins, for which purpose about four hundred were kept in stock.

Approximately three years ago we were requested to arrange our packing house at Plant No. 1 in order to make shipments of cement in bulk to accommodate one of our customers in North Carolina. Since that time the demand has grown to the extent of about 35% of the total daily loadings. The method of bringing the cement out of the bins is the same for bulk and package loading and is done by means of conveyors and elevators. The elevators deliver the cement to screens located on top of the packing bins. The following simple arrangement made it possible to place the loose cement in the car: A screw conveyor was erected in the bins under the screens in such a way that the screened cement would always flow into the conveyor as long as the bins were nearly full and the screw is in motion. The conveyor is enclosed in a casing from the bin wall to the location where the cars are loaded. Here the casing is connected with a telescopic pipe that extends through the car door opening. The ends are loaded alternately and the whole surface is leveled with a hoe. The entire operation requires about thirty minutes per car loading.

Cars used for package loading are not always fit for bulk shipments. Careful inspection is necessary, after which the cars must be made proof against leakage. This is done by covering the floor with heavy paper, being careful to lap the joints and to extend the paper up the sides about 8 in. The door openings are closed to a height of 4 ft. with 2-in. tongue and groove boards made in sections in advance. The sides are then covered carefully with paper and the car is ready to receive cement.

The loading operation has to be watched carefully to guard against overloading. The importance of this phase of the work can be appreciated from the fact that the Kingsport yards have no track scales at the present time and that the railroad company will not allow an overloaded car to proceed to destination if it is found on weighing to contain more than the rated capacity of the car. On the other hand, we are promptly advised by the railroad company if cars are consistently loaded light. In the absence of scales all bulk shipments are weighed at the nearest station having scales and the weights reported to us by wire. As a general rule, weights are received the day following the day cars are loaded, but this does not delay the delivery of shipments to our customers, because cars are put on the same through train after weighing. Pressure is being brought to bear upon the railroad company by the Kingsport plants and we feel that scales will be erected here. The request for scales we feel is a just one—we understand Kingsport to be the largest revenue station on the Clinchfield Railroad.

Bulk cement can be loaded on either loading track, but cannot be loaded on the same track at the same time that package loading is going on. Consequently, we make it a practice to load bulk cement the first thing in the morning and follow with package loading.

Shipments of bulk cement have been 100% satisfactory as far as we are able to discover. We have heard of no complaints in regard to shortage of weight due to leakage or in regard to damage to contents of cars in any way. This leads us to the conclusion that the loading operation is being watched carefully by men having our customers' interest in mind and who are desirous of giving their best always. The packing and loading department is in charge of E. F. Smith, and to him and his untiring efforts are we indebted largely for the results so far obtained. Smith, as we call him, is a veteran in the business, having been employed in the packing and stock house about twelve years. He served for several years as repairman in the department, after which he was made foreman, which position he has held since. Smith has the full co-operation of the men in his department, including two gangs of carefully trained packers, and to all these, too, must be given credit for the service we give. Nothing pleases all these employes more than to pack a couple of "extras" after the regular packing is done, thereby placing us in position to take care of late telegraphic orders.—*Penn-Dixie Doings.*

Protective and Curing Material for Cement Products

A NEW material "Stainproof" for protection of concrete surfaces during the curing period has been developed by the Master Builders Co., Cleveland, Ohio. The material is applied to the surface as a paint-like film 36 hours after the final troweling, and dries to form a non-porous, viscous film through which paint, plaster, tobacco juice and similar staining agents cannot penetrate. This film is said to be so tough that the heavy traffic new floors have to bear cannot grind through it to leave its marks in the cement beneath. When the cement surface is ready for use, the viscous film is removed to disclose finished work.

Proper curing of the surface is said to be insured by the film which seals up the original moisture in the topping, preventing too quick drying and allowing slow crystallization of the cement. Because of this, hair checking and efflorescing are said to reduced to a great extent.

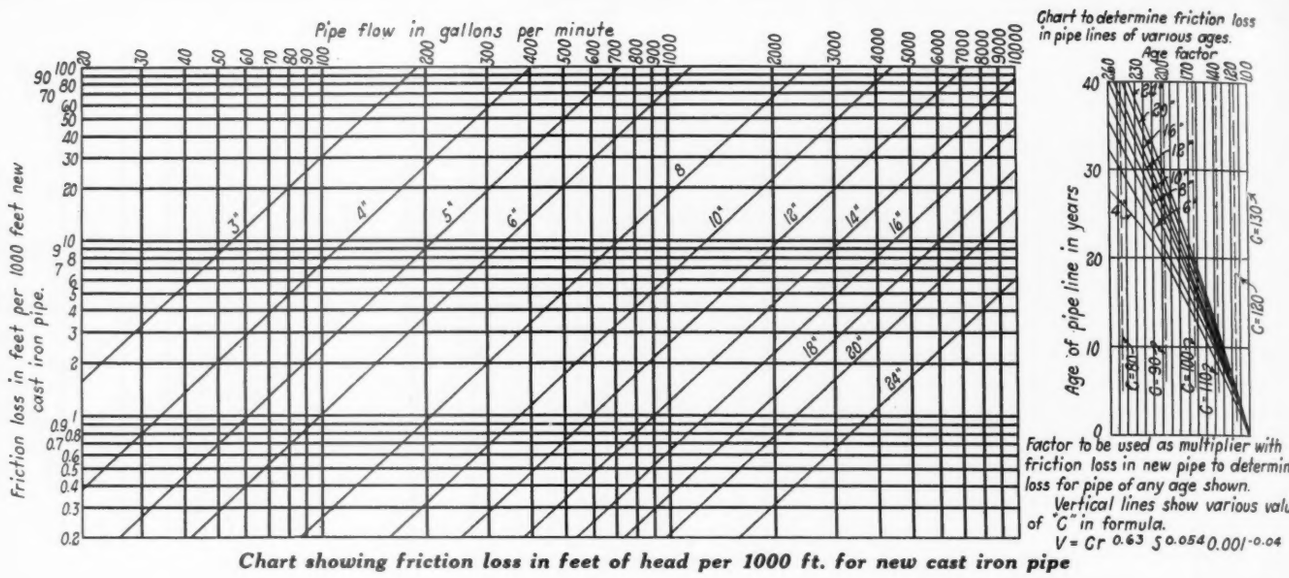


Chart showing friction loss in feet of head per 1000 ft. for new cast iron pipe

How to Determine Friction Losses in Water Pipe*

Charts Which Should Be of Especial Assistance to Operators of Pump Dredges

By F. J. Walter

Assistant Engineer, Nashville, Chattanooga & St. Louis Railroad, Nashville, Tenn.

THE determination of the proper and economical size of pipe lines in connection with railway water supply facilities is dependent very largely upon the frictional losses. A number of formulæ for the calculation of these losses have been advanced by various experimenters; however, these formulæ are practically all of the same general form and differ only in the exponents used. As the calculation of these losses is often quite laborious, charts have been prepared from which they can be determined readily, both for straight pipe and standard elbows and tees. The charts cover only those sizes of pipe which are usually encountered in water service work.

*From the report of the Committee on Water Service, presented before the convention of the American Railway Engineering Association, reprinted from *Railway Engineering and Maintenance.*

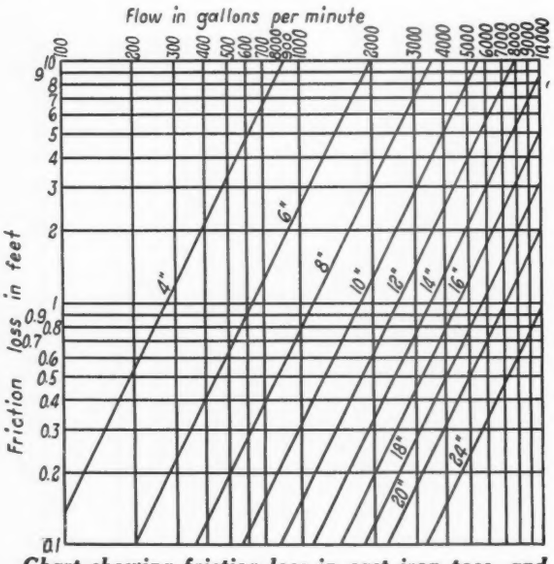


Chart showing friction loss in cast iron tees, and standard screwed and flanged 90-deg. elbows (A.W.W.A.)

The chart showing the friction loss in new cast-iron pipe is based upon the Hazen and Williams formula and assumes average water conditions, and that the pipe line is well laid. On the right-hand side of this chart another series of curves have been plotted showing age factors to determine the loss in pipe lines of any size.

The Hazen and Williams formula is a modification of the well-known Chezy formula. It is believed that it gives values which more nearly represent average conditions than do the earlier formulas.

In the construction of new pumping facilities, we are principally concerned with the determination of the pumping head at some future date, so that ample power may be provided to take care of future operating conditions. In such cases, it is the usual practice to determine the frictional losses for a pipe line from 15 to 20 years old. In using the charts in such instances, it will be found that an age factor multiplier of 1.63 will give the losses for pipe lines varying in age from 13 to 20 years, depending upon the size of the pipe used.

On the chart showing age factors, lines have been drawn for various values of the coefficient "C" in the formula used. These charts are thus applicable to pipe lines of other material, such as wood stave, or riveted steel, as well as uncoated cast-iron and centrifugal cement-lined cast-iron pipe, by using the multiplier corresponding to the

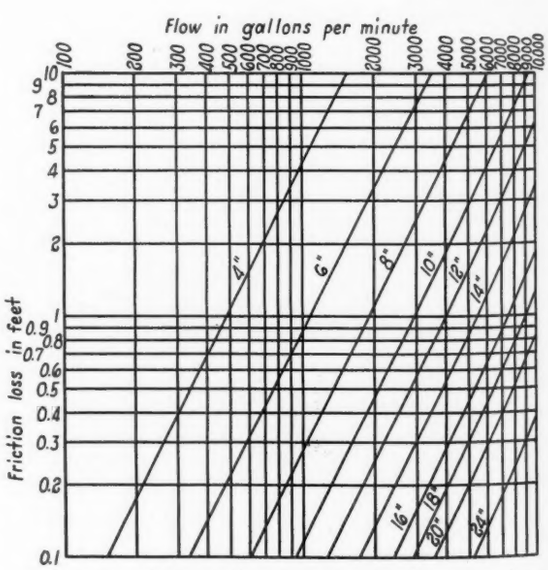


Chart showing friction loss in 90-deg. cast iron elbows (A.W.W.A. Standard)

proper value of "C" for the particular material. These values of "C" may be considered as follows:

For cement lined cast-iron pipe, "C" = 135 to 140.

For wood pipe, "C" = 130.

For riveted steel pipe, "C" = 110 to 120.

For uncoated cast-iron pipe, "C" = 120.

Graphs have been prepared showing the losses through standard elbows and tees. These graphs are based upon experiments made by Alexander, Williams and Brightmore, using cast-iron fittings ranging in size from 3 in. to 30 in.

Making Precipitated Chalk

By Alfred B. Searle

Consulting Adviser to the Lime, Cement and Clay Products Industries

(Reprint from the English publication, "The Stone Trades Journal")

"PRECIPITATED chalk" is a medicinal preparation which is also used in industries where an exceptionally pure calcium carbonate is required.

The requirements of the British Pharmacopoeia are met by a material produced by dissolving calcium chloride in water, adding rather more than an equal weight of sodium carbonate (which should previously have been dissolved in water), filtering off the precipitate and washing and drying it.

It will usually contain a variable proportion of soda, so that if a purer product is required amonium carbonate should be substituted for the soda.

When an exceptionally pure product is required the solution of calcium chloride should be first treated with sufficient ammonia or milk of lime to precipitate any iron, alumina and earthy phosphates present. These should be filtered off and the solution so purified used for treatment with ammonium carbonate.

The precipitated calcium carbonate must usually be dried and separated from coarse material before it is fit for use. Various methods of drying and grading are available, but one of the best is that patented by Stainer Hutchins, the plant being supplied by the Fusion Corporation, Ltd., Cledford Bridge, Middlewich, Cheshire. Ordinary revolving dryers are useless, as the wet calcium carbonate is slightly plastic, and adheres to the interior of the dryer and to any worms, scrapers or other ordinary devices which are intended to remove it. In Hutchin's patent dryer, on the contrary, the rotating cylinder is provided with three or more loose bars of peculiar shape which extend almost the whole length of the dryer. These bars, which bear some resemblance to the paddles of a steamer and still more to the blade-carrying shaft of a pugmill, lie loosely in the dryer and are raised, along with the carbonate, as the dryer rotates. On reaching a height at which the adhesion of the contents and centrifugal force of the dryer can no longer hold it, each breaker falls on to the material on the bottom of the drier and pulverizes it as though it were in a ball mill. In its journeys each breaker also rotates, and, consequently, acts as an efficient mixer, exposing fresh portions of the wet material to the warm air passing through the drier. The combined action of the rotating drum and the breakers causes the dried material to pass gradually through the drier and out into the grading device. The drying is effected by air, heated in a small furnace and drawn by a fan through the rotating drier. The drier itself is not heated, though external heating can easily be arranged if it were necessary.

The dry carbonate passing out of the rotating cylinder is taken to a bunker overhead by means of a simple bucket elevator. The air drawn through the drier carries in suspension a large proportion of the finest particles of calcium carbonate, and delivers these into a series of cyclone dust collectors, the sizes of which are designed to separate the coarse from the fine material. The very finest dust which cannot be caused to settle in a dust collector is delivered into a condensing tower in which it is washed with sprays of water and converted into a mud. Only a very small proportion of dust enters this tower, yet if it were allowed to escape into the atmosphere it might create a nuisance.

The arrangement produces three grades of material, viz., *coarse,* collected in the overhead bunker; *medium,* in the first dust collector, and *fine,* in the second dust collector. The small proportion of mud produced by the tower may be allowed to settle and then repassed through the plant, or, as its amount is usually very small, it may be thrown away.

The arrangement shown will deal with carbonate containing 45 per cent of moisture and will dry it so that the final product contains less than 1 per cent of moisture and is in the form of a fine white powder resembling whiting. The fine powder obtained from the two cyclone collectors will pass almost completely through a 200-mesh sieve and may be used for most purposes for which an extremely fine calcium carbonate is suitable.

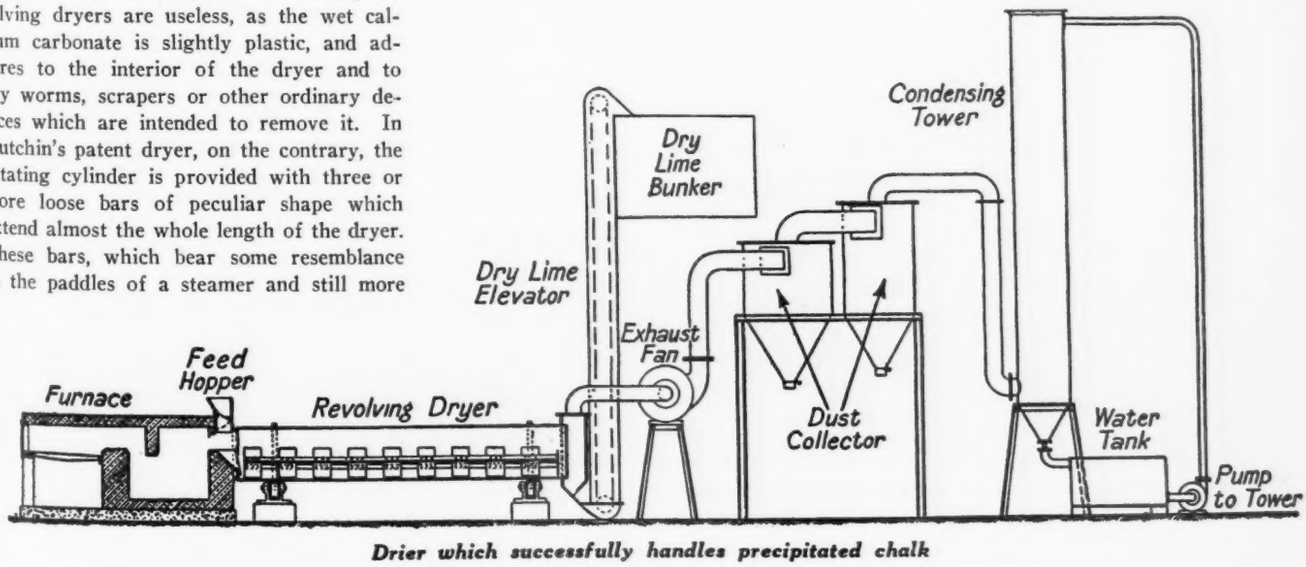
The cost of drying and grading, using a plant producing about 60 tons per week, is only about 8 d. per ton of dry product. If waste gases are available from some other source, the cost of drying and grading will only be about 5 d. per ton.

The term "artificial chalk" is occasionally applied to calcium carbonate obtained as a byproduct by one of the methods described in the preceding section.

Black Chalk or Spanish Chalk

Black chalk or Spanish chalk is not a lime compound, but a dark colored shale rich in carbonaceous matter.

Artificial black chalk is made by mixing calcium carbonate with lampblack or with an organic dye or with a decoction of logwood and solution of ferrous sulphate (green vitriol) and sufficient glue to enable the mixture to be shaped.



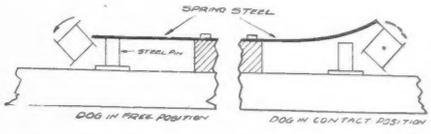
Drier which successfully handles precipitated chalk

Hints and Helps for Superintendents

Simple Vibrating Screen

SEVERAL of the silica sand plants in the Ottawa, Ill., district are using a simple vibrating screen which appears to give quite satisfactory results. The essential points of these screens at all the plants in which they are in use is quite similar, although they vary somewhat in the materials employed.

The screen is a wooden affair about 8 ft. long and 30 in. wide with sideboards of 8 in. height. The center is reinforced with a narrow strip of heavy wood which also serves as a place to fasten the Toncap screen cloth. On this center reinforcement are securely fastened two steel pins, 10 in. high and 1½ in. in diameter, each placed at about 18 in. from the middle portion of the screen length. A piece of 2x4 is bolted across the screen sides at the center. Two flat pieces of ⅜x2 in. spring steel slightly over 18 in. long are bolted to the cross timber, each extending to the iron pin. An iron dog running on a line shaft over the pin catches the spring steel and raises it so that on release (a point between the projections on the dog) it springs back sharply into position and in so doing imparts to the pin underneath a sharp rap. The sketch shows the spring steel held by the dog just at the point of release. With the line shaft running at 60 r.p.m., the four projections on the dog impart 240 impacts each minute on each pin or 480 per minute to the screen.



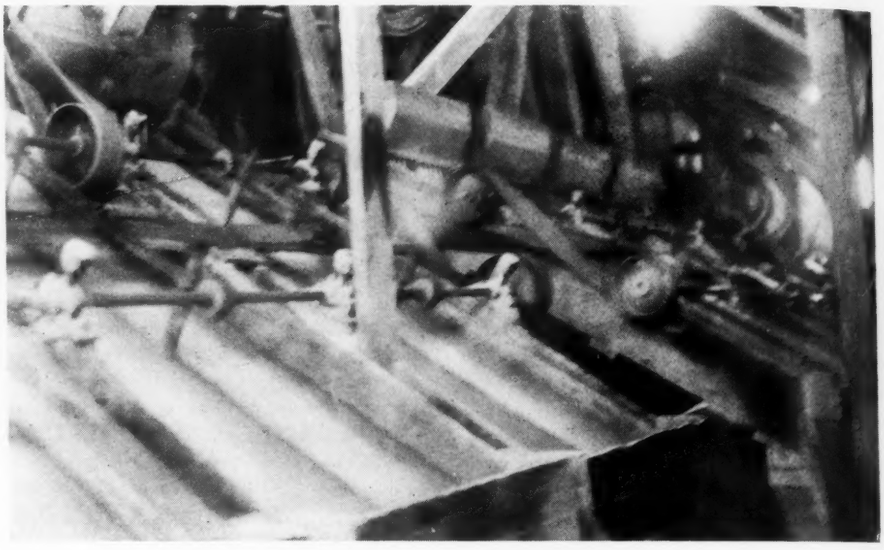
How the dog works

This arrangement can be easily made and since the only wear comes on the dog and steel pin, it is a simple and inexpensive matter to replace them with but little loss of time when worn.

Determination of Moisture in Aggregate

WHEN accurate control of the mixing water for concrete is to be maintained, a quick, simple method of determining the moisture content of the aggregate is desirable.

The method used is based on the fundamental principle of the difference in volume of water displaced by dry and moist sand. The volume of dry sand may be assumed to be constant so long as the grading, unit weight, and specific gravity of the sand do not change materially.



Simple vibrating screen that works on silica sand

There are several types of apparatus which may be adapted to this method. The apparatus described consists of a cylindrical brass container with a gage glass attachment as shown in the accompanying sketch. The container is 29 in. long and 3 in. in dia. with a funnel top 2 in. high and 4 in. in dia., and will accommodate a 5 lb. sample of sand. The container is carefully calibrated in cubic centimeters with the gradations marked on the gage glass.

To make the test, the container is filled with water to the 0-cc. mark on the graduated gage glass. A convenient weight, usually a 2000-g. sample, of dry sand is then placed in the container and the volume of water displaced is determined immediately by direct reading of the water level in the gage glass. This procedure is then repeated using the *same weight* (2000 g.) of damp sand and the volume of water displaced noted. The percentage of moisture is calculated by substituting the volumes of water displaced by the dry and damp samples, together with the weight of the sample in the following formula:

$$P = 100\,\frac{D\text{-}C}{W\text{-}D}$$

In which P = percentage of moisture by weight by dry sample,

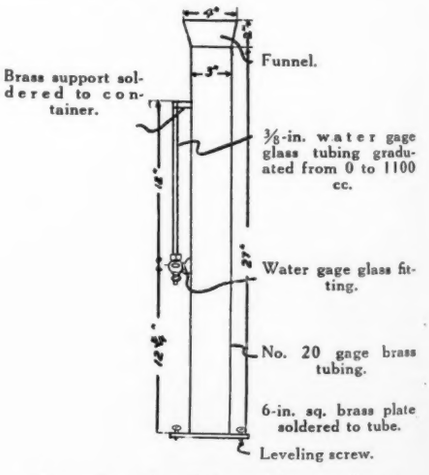
D = volume (in cc.) of water displaced by damp sample,

C = volume (in cc.) of water displaced by dry sample,

W = weight of sample (dry or damp).

If the weight of sample is measured in pounds, this weight must be converted to grams before substituting in the formula.

When placing the sand into the container it is essential that all entrained air be eliminated. This can be done by placing a small piece of wire coiled at one end in the container and carefully withdrawing it as the sand is poured in. In order to avoid errors due to absorption of moisture by the dry sand, it is necessary to read the displaced water immediately.



Apparatus for determining moisture

This method of determination has been found to be accurate within 0.5% of moisture, provided the operator exercises care in the weighing of the samples and reading of the water levels in the gage glass. This method is advantageous because it gives the surface moisture and obviates the necessity of correcting for absorption of the aggregate which is necessary when the method of drying the aggregate is used. The moisture determinator may be used for both sand and coarse aggregate.—*Concrete Highways.*

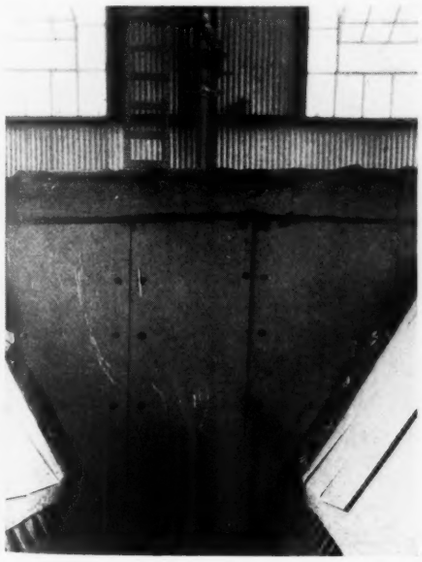
Unique Mounting of Crusher Service Hoist

THE use of pneumatic piston hoists for dumping cars and for grappling hooks suspended over primary crushers, at crushing plants, is common practice. The pneumatic hoist, because of its quick action and easy control from the car-dumping crusher platform, is particularly helpful in dislodging large rocks or boulders which become wedged in the crusher opening.

The air hoist is mounted horizontally

Usual practice is to suspend the hoist vertically over the crusher opening, with the hook fastened to it with a short connection. This requires headroom, and of course there is always some danger of the whole works falling into the crusher, much to the disadvantage of the crusher.

At the crushing plant of the Valley Forge Cement Co., West Conshohocken, Penn., described in ROCK PRODUCTS, October 29, 1927, the pneumatic hoist is placed horizontally on an I-beam support, on the center line of the primary crusher, but considerably removed from the crusher opening. The car-dumping hook is suspended by a wire rope, which passes over a pulley, located vertically over the car, in dumping position. The compressed-air controls for operation of the hoist are conveniently located on the center line of the crusher, on the wall of the crusher building.



Hoist controls are on the wall

The arrangement is neat and effective, and while the hoist in this installation is used to dump cars, the same layout could be very well adapted to operation of a crusher grappling hook.

Water for Drilling Blast Holes

SIX inches or a foot of hole more or less doesn't mean much to the driller, and as a rule he hardly gives the matter a thought, but let us see what 6 in. of hole on every hour's run amounts to in a year. The average production for each foot of 6-in. drill hole is about 18 tons of stone, and 6 in. of hole lost means nine tons less production—if this happens 10 times each day it means 90 tons per day or 18,000 tons during a year of 200 working days.

Rate of Progress

In limestone drilling it is customary to expect a good blast hole drill to cut from 3 to 5 ft. per hour actual drilling time, but when a careful account is kept of the daily operation it is usually found that there will be considerable variation in the rate of progress. In this character of drilling it is customary to run the bailer at intervals of about one hour or when 3 to 5 ft. of hole has been drilled, and if a careful measurement is taken on each run a variation of 6 in. or more is frequently found in the progress.

Cause of Delay

The driller who makes a study of what is taking place at the bottom of the drill hole will discover many causes of delay which can be eliminated by careful systematic operation, but in this article we will only have room to discuss one cause for retarded progress.

The correct amount of water in the drill hole is more important than a great many drillers realize, and we believe that too much or not enough water will make as much as 6 in. per hour difference in the drilling progress in certain formations and under certain conditions, therefore, we would suggest that the driller give this point some careful attention.

For example, when a fresh bit is started in limestone drilling, if two or three buckets of water are dumped in the hole the consistency of the sludge will not be heavy or thick enough to carry in suspension the large fragments of rock which are broken up by the sharp bit, therefore, the coarse cuttings or fragments will remain at the bottom of the hole until they are ground and powdered to such an extent that they will be floated or mixed in the thin sludge.

Amount of Water Required

In other words, it is a mistake to dump the water in the hole a bucketful at a time, as each time a bucket of water is added to the sludge the consistency of the mixture is thinned to such an extent that the coarse cuttings all settle at the bottom.

A good method of adding water to the drill hole is to use a small dipper or a tin can of about one quart capacity, to which a wood handle may be attached. The water supply should be within easy reach of the driller, who should dump the water in the hole a dipperful at a time and at such intervals as he finds by careful experimenting to be most efficient.

Testing for Results

In the harder formations the amount of water in the hole is not always so important, but soft limestone or any formation which drills at the rate of from 3 to 5 ft. per hour should have the exact amount of water in order to obtain the best results.

The first trial could be made with four or five buckets of water in the hole, and in order to get a comparison of extremes the hole should then be bailed dry and a run of the same period of time made with only one bucket of water, which should be dumped in the hole a pint at a time during the trial period.

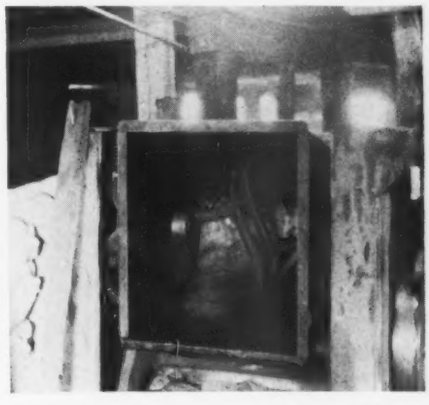
Check Progress

The next trial would be to make another run of the same length of time during which two buckets of water could be used, adding this to the hole at more frequent intervals with the same small dipper.

We believe that if a few experiments are made, in a great many cases the increase in progress which can be obtained by systematic operation will be well worth the effort.—*The Armstrong Driller.*

Unusual Concrete Mixer

THE accompanying view shows a bread dough mixer installed in the cement products plant of the Peoria Concrete Construction Co., Peoria, Ill., and used for mixing the facing for cement blocks. The dough mixer was obtained second-hand at slight cost, but apparently is just as efficient in operation as a new and expensive concrete mixer would be.



Bread mixer used for concrete

H. Struckmann—The Man and His Work

Being the Third of a Series of Interviews With Outstanding Leaders in the Industry on Their Business Philosophies

By Leon I. Thomas

"GIVE me a real insight into the management of a corporation, show me the viewpoint of those who sound its keynotes and define its policies," said one of the country's foremost bankers recently, "and I can generally tell more about that company and its prospects than will be revealed by the closest scrutiny of balance sheet and income account."

The soundness of this observation is apparent. Indeed, this banker might have gone a step farther and narrowed his inquiry down to the "man" in man-agement. For, in the last analysis, you find in every truly successful corporation a man who is its inspiration and its driving force. His ideas as well as his ideals are apparent in everything the company does or says. His ability to erect a smooth-running, harmonious organization to put his ideals into practical effect is the secret of his success.

When a corporation has welded together just such an organization, an organization operating at widely separated points throughout two continents—the philosophy of management which is responsible for that result may indeed be of great interest.

It was with these thoughts in mind then that I interviewed Holger Struckmann, president of the International Cement Corporation. In contrast with the disposition one so frequently encounters in this business of interviewing, Mr. Struckmann did not throw out the usual injunctions—"But don't quote me on this or that because of such and such conditions." The spontaneity of his answers to a wide variety of questions reflects a policy of placing all the cards on the table, which, in all probability, is the simple secret of his success as an executive.

Boiled down to its essence, Mr. Struckmann's philosophy of management is expressed in the following creed:

1. To build the business with picked men, men who have imagination and resourcefulness as well as experience and judgment;

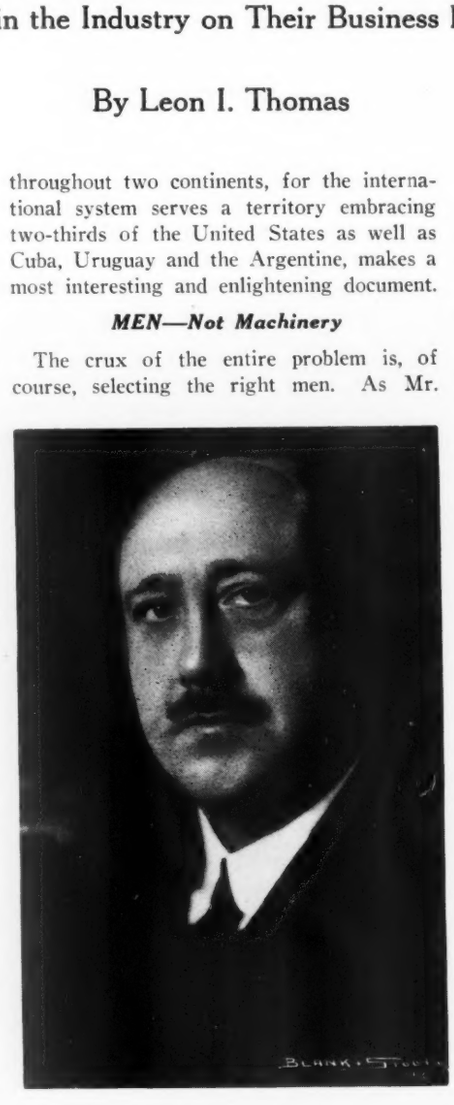
2. To establish and maintain an attitude toward quality which refuses to accept "good enough" as an answer;

3. To deal with each customer as though both buyer and seller were members of the same organization.

The means by which this creed has been translated into an actual every day reality throughout two continents, for the international system serves a territory embracing two-thirds of the United States as well as Cuba, Uruguay and the Argentine, makes a most interesting and enlightening document.

MEN—Not Machinery

The crux of the entire problem is, of course, selecting the right men. As Mr. Struckmann expressed it: "We select good men, give them good tools and present to them a good, fair business policy to work under. After a man proves capable, we back him to the limit. Of course, we know that any man will occasionally make mistakes, else he would not be human. In such cases, the error is pointed out and the man cautioned not to make the same mistake again. That in fact is what experience is—the making of mistakes and then learning not to make the same mistakes again.



H. Struckmann

"We conceive it is the duty of each individual in an organization to teach his job to the man below him and, in turn, to learn the job next above him in the organization scale.

"Of course, nobody loses sight of the fact that concerns are in business to make a profit, and that profits, other things being equal, are greater where you obtain from your men this whole-hearted enthusiastic effort.

"But I believe that deliberately to set about to get all you can out of your men is the wrong method of approach. Doing it that way is to set up many bunkers and hazards all along the course. Rather let the executive be keen to keep ever in view the plans of the employ as well as the plans of the company. It will generally be found that the two match pretty closely. At least that has been our gospel, and we believe a sound one, too.

"Take the application of this to the matter of salaries. One of the things of which I am proudest is that I have never had a man ask for a raise in salary. If an employe has earned an increase in his salary, we always try to beat him to it. This is a situation that could not exist except as the men know that the policy of the management is to be fair.

"Nor are salary increases calendar events taking place at Christmas or New Year's. They take place whenever conditions warrant. As further evidence that this gospel of ours is not merely an empty creed, we have a bonus arrangement applicable to all who are on salary. In the first place, we don't put a man on salary until he has proven his merit; our salaried men form the backbone of our institution. For purposes of the bonus plan we consider an employe's annual salary as equivalent to the par value of a stockholder's holdings, and we pay equal percentage of dividends to both. Thus, if dividends to stockholders in any one year are on the basis of 10%, the salaried employe gets 10% of his annual salary.

"We also have group life insurance for all of our employes, and consider it as a very much worthwhile undertaking. Our labor turnover is very low. We have no elaborate organization machinery for accomplishing this result, either directly or indirectly. We simply try to do business with both employes and customers in a human, neighborly way.

"We believe strongly in the value of personal contact—in fact, we feel that this is

more important than any other factor in management. I visit the plants at frequent intervals and get all the department heads together for a luncheon meeting. This gives an opportunity for us to know one another better and for me to impress on them their responsibilities toward the company.

"At these meetings I ask for suggestions and each man talks with complete candor. If the men have any grievances they are free to come in and discuss them.

"Lest you think that we lean overmuch toward the employe as compared with the stockholder, perhaps it ought to be said that I believe that our stockholders are entitled to every bit of information which we in the management have. Thus we try to give them at frequent intervals full reports that present more than the mere financial status of the company. For instance, we write a letter to every new stockholder, a brief informal greeting, if you will, telling him of our desire to keep him fully informed about his company, and to keep him informed regularly by means of reports and bulletins. The result is that each stockholder is in effect a salesman for us and all are 'rooting' for the company.

When "Good Enough" Does Not Suffice

"Next comes the subject of maintaining quality. While our industry has regularly established standards of minimum quality, we try in our particular business to exceed these standards by a wide margin. It seems to me a mistake for any business whatever its line to do less than its level best as to quality of product within the limits set for itself. Hence our slogan 'Never accept "Good enough" as the answer.'

"Research work, carried forward steadily and consistently, has enabled us to solve several particularly difficult raw material problems. But its greatest result with us has been to make possible a single standard of quality in 11 widely separated mills with the result that whether our cement is bought in Maine or in Texas, in the Dakotas, Cuba, Argentine or Uruguay, it is identical in quality and runs uniform day in and day out.

In our line of business, as in most others, improved machinery has materially reduced the unit labor cost. Nor is the end yet. To be on the search for improved labor-saving machinery and to be willing to devote capital for this purpose constitute an important duty of the heads of commerce if they are to continue in profitable business. Cement mills have improved in this respect to such an extent that the output per man employed is now well on its way to double what it was only 10 years ago.

"Aside from the improved machinery itself is the contributing fact that there is today a better understanding of the operators of that machinery. Boiled down to fundamentals, my policy on machinery and equipment is this: Give the men good tools, see that they are used intelligently and that they are maintained properly. We spare nothing in maintenance and in 'good housekeeping' about our mills. We believe that this policy pays from economy and efficiency viewpoints.

Merchandising the Product

"We have endeavored to put into practical effect in our relations with the trade and indeed the public generally, that part of the international creed which requires our organization 'To treat every customer as though both buyer and seller were members of the same organization.' That this is strictly adhered to is evidenced, for instance, by our dealer policy. We sell our product through dealers, not just occasionally but always; we do this because experience has shown that it is in the best interest not only of the user but ourselves as well. There is no psalm-singing about it; it is just plain good business, that is all.

In the Foreign Field

"Experience with our plants in Cuba and South America has afforded interesting confirmation of the soundness of these policies. The Latin-American people must have full confidence in a company before they will do business with it. One of the officials in Montevideo, Uruguay, said to me, 'We require outside capital down here to develop our industries and we like American capital because it means clean business.'

"You see, incidentally, that, wholly apart from consideration of one's own concern, there is a certain responsibility toward maintaining a good reputation for one's country—a sort of patriotic duty where business is done in foreign countries.

Proper Use of a Budget

"And now a word about checking progress and keeping the machine headed on its course. To do this we put considerable store on budgets as a means of intelligently controlling expenditures. These budget figures we set at the first of each year. They are taken up with the board of directors just after the books are closed for the year. A copy goes to each branch of the organization involved. Each subsidiary company notifies me monthly of the status of the work done under a budget and that gives me an opportunity to revise the figures from time to time as necessary.

"As everybody knows, budgets that are worth anything are not hard and fast determinations, but properly used and adequately adjusted up or down at regular intervals, they are useful tools in executive control. I want to make it perfectly clear, however, that we do not apply budgets to maintenance work. There can be no compromise as regards maintenance. It must be accomplished whatever the cost.

Strong Local Plant Management

"There is a phase of our management which may interest others, particularly if they operate branch plants or subsidiaries. I refer to the operating policy of building a strong local management in each of our subsidiary companies. Instead of being a local 'branch' of a remote directing management, each of our mills stands upon its own feet and each has as its operating head a vice-president of our company. He is charged with the sole operation of his plant. We give him the whole job. He is 'king of all he surveys' subject only to engineering and managerial advice of the headquarters organization at New York.

"So that I may know just what is going on, I receive every morning a cabled or telegraphed report of production figures and cost per barrel of cement produced the day before for every plant we have, South American and Cuban plants included.

"On the third or fourth day of each month, by means of a special code which we have devised, we receive by cablegram an audited report covering the result of operation of each subsidiary for the preceding month and, from these reports, we compile a comparative statement which we forward to all subsidiary companies. This creates a friendly competitive spirit which I believe is a valuable adjunct to successful management and operation of widely separated subsidiaries such as those owned by Internation Cement Corp."

New Canadian Mica Deposit Reported

AFTER three years of struggling against the odds connected with the development of a mine far from the regular lines of communication, success has attended the efforts of the General Holding Company, headed by Edmonton, Alberta, men, and their mica mine, near Fort Grahame, on the Finlay river, may now turn out to be among the best mica properties on the continent according to an Edmonton correspondent. Major A. C. M. Anderson is president; C. L. Freeman is local director, and Gordon F. Dickson is consulting engineer for the company. The property consists of a number of leases lying above timber line on the upper reaches of the Finlay river, a few miles from Fort Grahame, in northern British Columbia.

Hitherto the company has directed its efforts to the development of the mine rather than to commercial production. It is said that 1,000 pounds were brought out this fall by the miners when they came down. The price of this mica on the market is around $2.00 to $2.75 per pound. Samples shown were of exceptional clearness.

The mica is potash mica or muscovite and is considered far superior to the other variety, magnesian mica, or phlogopite. Large deposits of the latter variety occur in the province of Quebec.

According to a paper on "Mica and Its International Relationships," read at the recent Empire Mining congress in Canada by G. V. Hobson, a mining engineer from India, there is a constantly increasing demand for mica. The principal sources of world supply lie within the British empire, with India leading in output.

Stone, Sand and Gravel Producers Discuss Rates at Little Rock

SOUTHWESTERN producers of sand, gravel and crushed stone held a very business-like meeting at Little Rock, Ark., in the latter part of October, to consider freight rates. The meeting was held to prepare for the coming rate hearing before the Interstate Commerce Commission which is to be held at New Orleans and Dallas in the early part of December, and which is a part of the general investigation of rates on the commodities mentioned, in the Southwestern territory, which the commission is making. What follows is abstracted from advance proofs of the report of the meeting which is to be published in the forthcoming issue of the *National Sand and Gravel Bulletin*. A partial report was published in ROCK PRODUCTS for October 29.

The meeting could work to definite ends because Attorney Frank Leffingwell, who has been retained by the producers of the territory to represent them had secured an order from the commission which asked the producers to come to agreement on certain matters before presenting their case. The order also asked certain questions and the producers were expected to agree on the answers. In summarized fashion the order read:

"It is believed that if the parties who expect to submit definite proposals at the hearing will, prior to such hearing, exchange such proposals with each other that much less time will be consumed in the hearing of these proceedings than would otherwise be the case; that the record can be very materially curtailed, and disposal of the matters under consideration expedited. Therefore, the parties to these proceedings (shippers and carriers), both present and prospective, will be expected to exchange with each other on or before November 21, 1927, the proposals which they respectively expect to submit at the hearing and to furnish the Commission at the time of such exchange with a copy of proposals. . . . To the end that testimony offered may concern only controverted and material facts all parties to the proceedings are urged to give consideration to the following questions and, if possible, be prepared at the opening of the hearing to state for the record the result of such consideration:

1. Assuming that as a result of these proceedings a basis of rates is prescribed for the future, can agreement be reached as to the list of commodities that should be covered by the rates prescribed?
2. Can agreement be reached as to average value at shipping point of the different commodities involved in these proceedings?
3. If the respective commodities differ in value, does such difference warrant a difference in the transportation rate?
4. Can agreement be reached as to the average loading of each commodity?
5. Can agreement be reached as to the points of shipment of each of the commodities in the territory covered by the proceedings?
6. Can agreement be reached as to the extent of the movement for a representative period of the different commodities?
7. It is agreed that the operating and transportation conditions throughout the general territory covered by these proceedings are similar?
8. It is agreed that the same basis or level of rates should apply on these commodities throughout the general territory covered by the proceedings?
9. Assuming that the same basis or level of rates should apply throughout the general territory, can the parties agree as to how this should be accomplished? That is, by the prescription of a mileage scale of rates, group basis, or point to point basis?
10. The enumeration of the above questions for consideration is not meant to exclude from consideration by the parties other matters which might occur to them and upon which an agreement might be reached."

A committee formulated the answers to the questions and these answers were thoroughly discussed in the open meeting when the committee presented its report. Answering the first question, the committee listed the following as the commodities to be covered by the prescribed rates:

"Sand, except asbestos sand; gravel; crushed stone (broken stone ranging in size up to 200 lb. weight); including ground limestone, but not including gypsum rock; riprap (irregular shaped rock) in pieces ranging up to 200 lb. weight; clay (except ground clay in bags and treated or milled fire clay; common shells, whole or crushed; crushed tile and crushed sewer pipe (imperfect hollow tile and sewer pipe crushed for use instead of crushed stone); soil, cinders; crushed bricks or brickbats; chats (mine gravel), whole or crushed, and slag, not pulverized, in bulk, in straight or mixed carloads; minimum weight 90% of marked capacity of the car, except that when actual weight of cars loaded to full visible capacity is less than 90% of the marked capacity, such actual weight shall be used."

Answering the second question, the committee said that agreement could be reached as to the average value of the commodities at the shipping point, but it said "no" to the third question, indicating that difference in value did not warrant a difference in weight.

The fourth, fifth and sixth questions were hardly debatable. Average loadings taken from highway commissions records, in the interested states, will be presented to the commission, and testimony will be presented as to agreement on points of shipment and also as to the extent of the movement of the commodities affected in 1926, taken as a representative year.

The seventh question was the subject of considerable discussion, but the final action taken, as recommended by Chairman W. M. Barrow, stipulated that "Inasmuch as the Interstate Commerce Commission has in numerous proceedings held that the operating and transportation conditions in the general territory involved in this proceeding are similar, until other evidence is offered, and for the purpose of this case only, it is agreed that the operating and transportation conditions throughout the general territory covered by these proceedings are similar."

The answer agreed upon for the eighth question was "Yes; it is agreed that the same basis or level of rates should be made to apply generally throughout the territory." The ninth question of the commission inquired as to how this should be accomplished, and the meeting recommended in answer: "By the publication of rates in cents per ton of two thousand pounds, on mileage scales; one scale for single line application over two or more lines not under the same management or control; rates to be calculated via the shortest route between point of shipment and destination over which carload freight may be interchanged; and in the calculation of distances via such routes, where distances are stated in fractions of a mile, fractions of less than one-half are to be dropped and fractions of one-half or greater to be considered as one mile."

At this point, Chairman Barrow reminded the meeting that the Interstate Commerce Commission had suggested that the parties in the proceedings should exchange proposals prior to the hearing, and that it would be necessary, therefore, for the producers to come to an agreement as to the scale of rates for which they would contend. After thorough consideration of the matter the meeting finally agreed upon the "Baton Rouge Scale," prepared by W. B. Redding of the Louisiana Highway Commission which is as follows:

BATON ROUGE SCALE

Rates stated in cents per ton of 2000 lb.

Distance	Single Line	Joint Line	Distance	Single Line	Joint Line
10	37	50	260	128	138
20	42	55	280	133	143
30	47	60	300	138	148
40	52	65	320	143	153
50	57	70	340	148	153
60	62	75	360	153	158
70	67	80	380	158	163
80	71	84	400	163	168
90	75	88	420	167	172
100	79	92	440	171	176
110	83	96	460	175	180
120	87	100	480	179	184
130	90	103	500	183	184
140	93	106	520	187	187
150	96	109	540	191	191
160	99	109	560	195	195
170	102	112	580	199	199
180	105	115	600	203	203
190	108	118	640	210	210
200	111	121	680	217	217
210	114	124	720	224	224
220	117	127	760	231	231
230	120	130	800	238	238
240	123	133			

The steering committee which will supervise the case of the producers in its presentation before the commission now consits of: F. E. Bolte (chairman), Rhea Miller, E. Eikel, E. A. Starr, J. M. Chandler, J. N. Daly, R. S. Wilson, E. L. Huddleston, J. S. Meriwether, R. A. Gibson, S. A. Fones, A. S. Henderson. Mr. Barrow was instructed by the meeting to advise Commissioner Lewis of the Interstate Commerce Commission with respect to the action taken by producers and also to ascertain what the carriers (who have also received the order) have done or intended to do in complying with the suggestions of the commission.

Editorial Comment

Dust Control

Dust control is coming to be one of the major problems of the rock products industry, as new plants are being built near centers of population and old plants find themselves surrounded with residences, from the spreading of towns and cities. Sooner or later, practically every rock products plant that does not have a dustless operation will find itself confronted with the necessity of dust control.

The study of dusts and the invention of machines to collect and dispose of them has fortunately advanced rapidly in the past five years. It is possible now to install dust-collecting systems that are designed instead of being built by rule of thumb, and the purchaser need not be disappointed in the results obtained from an expensive installation, as he sometimes was in the past. In the present state of the art there are four recognized methods of dust collecting, simple settling in dust chambers, cyclones and improved settling devices; washing with sprays and by-passing the dust laden air through water; filtration of the air to remove suspended dust, and electrical precipitation. Roughly speaking, the expense for both installation and operation increases proportionately with the fineness of the dust removed. This holds true of two devices working with the same system, as large and small settling chambers, and it also holds true in comparing two systems. Thus electrical precipitation, which will remove all suspended matter, is more expensive to install than settling chambers, but settling chambers cannot settle the finest dust or condense fumes which are often more objectionable.

The important thing to remember is that every system and every device has both limitations and advantages. As examples, two recent cement plants, near large cities, where people would be quick to complain of a dust nuisance, get satisfactory results by well designed settling apparatus. On the other hand, a cement plant, built not so long ago, was forced to install electrical precipitation after expensive experimenting with other methods. Consideration other than efficiency may influence a choice, as in the case of one crushing plant that installed an air filtration system which, it was determined, will pay for itself in a few years from the utilization of the dust collected.

The matter of dust collection is of such growing importance that it would seem to be a field for more intensive research than has been given it by the interested branches of the rock products industry. At present it does not seem that laboratory research is needed so much as the collecting and classifying of methods and conditions to be met, not only in the rock products industry but in all industries in which dust control is a factor.

Rock Products and Storm Damage

A little storm of wind and rain, such as might be expected at almost any time in the middle latitudes, went through northern Illinois recently—and the city of Washingington, D. C., still more recently. In one small town it demolished several structures and injured several persons, some of them seriously. The weather bureau estimated the force of the wind at 80 miles per hour. It was typical rather than an unusual occurrence, since such storm damage is reported many times each year from different parts of the country.

It is the custom to speak of such damages to life and property as misfortunes and as caused by an "act of God." But cold reasoning shows them to be nothing but the penalty of poor building construction. Evidence from such experience as several cities on the Southern coast have passed through demonstrates that good construction of almost any type can withstand winds of 120 miles per hour, without suffering serious injury. Aside from real tornadoes it is doubtful if there are any storms that can really damage a well built structure.

In the poverty of pioneer times and the rush of feverish building activity that came with the rapid settlement of the country in the 80's and 90's, there may have been an excuse for poor construction, but there is no such excuse today. Good building materials are abundant and reasonably cheap, and building methods and design have advanced to where it is possible to build a fireproof and windproof residence or business building at a cost which is well within the reach of the ordinary investor. As an example, a concrete block building may be put up at a cost of only 2% to 3% above that of good timber construction in many American cities.

The growth and development of the rock products industry has already been responsible for a lessened storm damage. Terrible as were the losses from one tropical hurricane, which damaged more than one Southern coast city, it can be shown that these losses might have been multiplied several times if rock products materials had not been so much used. And as for winds of 80 miles an hour, such materials, properly placed in a building, will withstand them without showing a crack or a strain.

All over the United States building codes are being redrawn, or are being adopted for the first time. It is the duty of those who draw such codes to see that rock products materials are given proper recognition in them, not only because of fairness to a great and growing industry, but because the use of such materials means safety; complete safety in the case of ordinary wind storms as well as safety from fire.

Financial News and Comment

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

(These are the most recent quotations available at this printing. Revisions, corrections and supplemental information will be welcomed by the editor.)

Stock	Date	Par	Price bid	Price asked	Dividend rate
Allentown Portland Cement Co. (common)[33]	Nov. 18	.....	3½	7½	
Allentown Portland Cement Co. (6% bonds, 1932)[33]	Nov. 18	.....	90	92	
Alpha Portland Cement Co. (common)[2] new stock	Nov. 22	No par	33	36	75c quar. Oct. 15
Alpha Portland Cement Co. (preferred)[2]	Nov. 22	100	112	115	1¾% quar. June 15
American Lime and Stone Co. (7% bonds, 1942)[32]	Nov. 18	.....	100½	101½	
Arundel Corporation (sand and gravel—new stock)	Nov. 22	No par	48⅜	48½	50c Oct. 1
Atlantic Gypsum Products Corp. (1st 6's carrying 10 sh. com.)[10]	Nov. 23	.....	117	120	
Atlas Portland Cement Co. (common)[2]	Nov. 22	No par	40	43	50c qu. Sept. 1
Atlas Portland Cement Co. (preferred)	.....	100	.....	.....	2% qu. Oct. 1
Atlas Portland Cement Co. (preferred)[2]	Nov. 22	33⅓	43	.....	2% qu. Oct. 1
Beaver Portland Cement Co. (1st Mort. 7's)[8]	July 29	100	100	100	
Bessemer Limestone and Cement Co. (Class A)[4]	Nov. 22	.....	38½	39	75c quar. Oct. 31
Bessemer Limestone and Cement Co. (6½% bonds)[4]	Nov. 4	.....	100¼	101	
Bessemer Limestone and Cement Co. (common)	.....	.....	.....	.....	75c quar. Oct. 31
Boston Sand and Gravel Co. (common)	Nov. 18	100	75	80	1% qu., 2% ex. Jan. 1
Boston Sand and Gravel Co. (preferred)	Oct. 21	.....	85	90	1¾% quar. Jan. 1
Boston Sand and Gravel Co. (1st preferred)	Oct. 21	.....	90	95	2% qu. Jan. 1
Canada Cement Co., Ltd. (common)	Nov. 19	100	246	.....	1½% quar. Oct. 17
Canada Cement Co., Ltd. (preferred)[11]	Nov. 19	100	122	.....	1¾% quar. Nov. 16
Canada Cement Co., Ltd. (1st 6's, 1929)[11]	Nov. 19	.....	101½	102½	3% semi-annual A&O
Canada Cement Co., Ltd. (new common)	Nov. 19	.....	30½	31½	
Canada Cement Co., Ltd. (new preferred)	Nov. 19	.....	93½	94½	
Canada Cement Co., Ltd. (new units)	Nov. 4	.....	107	107½	
Canada Crushed Stone Corp., Ltd. (6½s, 1944)[11]	Nov. 19	100	96	99	
Charles Warner Co. (lime, crushed stone, sand and gravel)	Nov. 18	No par	37	39	50c Oct. 10
Charles Warner Co. (preferred)	Nov. 18	100	110	.....	1¾% quar. Oct. 27
Cleveland Stone Co. (new stock)	Nov. 22	.....	65	70	50c qu. 50c ex. Dec. 1
Connecticut Quarries Co. (1st Mortgage 7% bonds)[17]	Nov. 18	100	105	.....	50c qu. June 15
Consolidated Cement Corp. (1st Mort., 6½s, series A)[21]	Nov. 23	100	96	99	
Consolidated Cement Corp. (5 yr. 6½% gold notes)[21]	Nov. 23	100	94	98	
Consumers Rock and Gravel Co. (1st Mort. 7s)[18]	Nov. 17	100	99½	101½	
Coosa Portland Cement Co. (6% bonds, 1944)[33]	Nov. 17	.....	69	70	
Coplay Portland Cement Co. (6% bonds, 1941)[33]	Nov. 17	.....	88	92	
Dewey Portland Cement Co. (1st mort. 6's 1942)[30]	Nov. 23	100	99	100	
Dolese and Shepard Co. (crushed stone)[7]	Nov. 22	50	104	106	1.50 Jan. 1, 1.50 ex. Jan. 1
Egyptian Portland Cement Co. 7% pfd.[21]	Nov. 18	.....	85	95	1¾% quar. July 1
Egyptian Portland Cement Co. (common)[21]	Nov. 18	.....	5	8	40c quar. Oct. 1
Egyptian Portland Cement Co. (warrants)	Nov. 18	.....	No market		
Fredonia Portland Cement Co. (6½% bonds, 1940)[32]	May 24	.....	97	101	
Giant Portland Cement Co. (common)	Nov. 22	50	40	45	
Giant Portland Cement Co. (preferred)	Nov. 22	50	40	45	3½% June 15
Ideal Cement Co. (common)	Nov. 22	No par	95	97	$1 quar. Oct. 1
Ideal Cement Co. (preferred)[23]	Nov. 22	100	111	113	1¾% quar. Oct. 1
Indiana Limestone 7's (1936)	Nov. 9	.....	98	100	
International Cement Corporation (common)	Nov. 22	No par	56⅛	56½	$1 quar. Sept. 30
International Cement Corporation (preferred)[2]	Nov. 22	100	110	112	1¾% quar. Sept. 30
Kelley Island Lime and Transport Co.	Nov. 22	100	190	195	$2 quar., $2 ex. Oct. 1
Lawrence Portland Cement Co.[2]	Nov. 22	100	105	108	2% quar.
Lehigh Portland Cement Co.	Nov. 22	50	123	125	1½% quar.
Lehigh Portland Cement Co. (preferred)	Oct. 24	.....	73	78	
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, 1928 to 1931)[13]	Aug. 12	100	99½	100	
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, 1932 to 1935)[13]	Aug. 12	100	97½	99	
Marblehead Lime Co. (1st Mort. 7's)[14]	Nov. 18	100	100	.....	
Marblehead Lime Co. (5½% notes)[14]	Nov. 18	100	98	.....	
Michigan Limestone and Chemical Co. (common)[6]	Nov. 22	.....	35	.....	
Michigan Limestone and Chemical Co. (preferred)[6]	Nov. 22	.....	24	26	1¾% quar. July 15
Missouri Portland Cement Co.	Nov. 22	25	38	39	50c Nov. 1
Monolith Portland Cement Co. (common)[9]	Nov. 17	.....	12¾	13¼	8% ann. Jan. 2
Monolith Portland Cement Co. (units)[9]	Nov. 17	.....	31¼	33¼	
Monolith Portland Cement Co. (preferred)[9]	Nov. 17	.....	9½	10	
National Cement Co. (7% bonds)[38]	Nov. 21	100	95	97	
National Gypsum Co. (common)[35]	Nov. 22	.....	.....	36	
National Gypsum Co. (preferred)[35]	Nov. 22	.....	78	80	
National Gypsum Co. (pref. carrying acc. div.)[35]	Sept. 15	.....	86	88	
Nazareth Cement Co.[20]	Nov. 18	No par	32	34	75c quar. Apr. 1
Newaygo Portland Cement Co.[1]	Nov. 18	.....	115	.....	
Newaygo Portland Cement Co. (6½% bonds, 1938)[32]	Nov. 18	.....	102	104	
New England Lime Co. (Series A, preferred)[14]	Nov. 18	100	.....	95	
New England Lime Co. (Series B, preferred)[22]	Sept. 26	100	97	99	
New England Lime Co. (V.T.C.)[22]	Sept. 26	.....	33	35	
New England Lime Co. (6s, 1935)[14]	Nov. 17	100	98	100	
New York Trap Rock Corp. (6% bonds, 1946)[22]	Nov. 22	.....	101	101	
North American Cement Corp. 6½s 1940 (with warrants)	Nov. 21	100	80½	82½	
North American Cement Corp. (units of 1 sh. pfd. plus ½ sh. common)[32]	Nov. 18	.....	35	40	2 mo. period at rate of 7%
North American Cement Corp. (common)[19]	Apr. 9	.....	8⅛	9	
North American Cement Corp. (preferred)	Apr. 25	.....	.....	.....	1.75 quar. Aug. 1
North Shore Material Co. (1st Mort. 6's)[15]	Nov. 9	100	98½	.....	
Northwestern States Portland Cement Co.[37]	Nov. 21	.....	165	170	

[1]Quotations by Watling, Lerchen & Hayes Co., Detroit, Mich. [2]Quotations by Bristol & Willett, New York. [3]Quotations by True, Webber & Co., Chicago. [4]Quotations by Butler, Beading & Co., Youngstown, Ohio. [5]Quotations by Freeman, Smith & Camp Co., San Francisco, Calif. [6]Quotations by Frederic H. Hatch & Co., New York. [7]Quotations by F. M. Zeiler & Co., Chicago, Ill. [8]Quotations by Ralph Schneeloch Co., Portland, Ore. [9]Quotations by A. E. White Co., San Francisco, Calif. [10]Quotations by Lee Higginson & Co., Boston and Chicago. [11]Nesbit, Thomson & Co., Montreal, Canada. [12]E. B. Merritt & Co., Inc., Bridgeport, Conn. [13]Peters Trust Co., Omaha, Neb. [14]Second Ward Securities Co., Milwaukee, Wis. [15]Central Trust Co. of Illinois, Chicago. [16]J. S. Wilson, Jr., Co., Baltimore, Md. [17]Chas. W. Scranton & Co., New Haven, Conn. [18]Dean, Witter & Co., Los Angeles, Calif. [19]Hemphill, Noyes & Co., New York. [20]Quotations by Bond & Goodwin & Tucker, Inc., San Francisco. [21]Baker, Simonds & Co., Inc., New York. [22]William C. Simons, Inc., Springfield, Mass. [23]Blair & Co., New York and Chicago. [24]A. B. Leach and Co., Inc., Chicago. [25]A. C. Richards & Co., Philadelphia, Penn. [26]Hincks Bros. & Co., Bridgeport, Conn. [27]J. G. White and Co., New York. [28]Mitchell-Hutchins Co., Chicago, Ill. [29]National City Co., Chicago, Ill. [30]Chicago Trust Co., Chicago. [31]McIntyre & Co., New York, N. Y. [32]Hepburn & Co., New York. [33]Boettcher & Co., Denver, Colo. [34]Kidder,, Peabody & Co., Boston, Mass. [35]Farnum, Winter and Co., Chicago. [36]Hanson and Hanson, New York. [37]S. F. Holzinger & Co., Milwaukee, Wis. [38]McFetrick and Co., Montreal, Que.

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS (Continued)

Stock	Date	Par	Price bid	Price asked	Dividend Rate
Pacific Portland Cement Co. (common, new stock)	Nov. 18	.....	25	.....	
Pacific Portland Cement Co., Consolidated[5]	Oct. 21	100	61¾	.....	25c mo.
Pacific Portland Cement Co., Consolidated (preferred)	Nov. 18	.....	81	.....	
Pacific Portland Cement Co., Consolidated (secured serial gold notes)[6]	Oct. 20	100	98½	.....	3% semi-annual Oct. 15
Peerless Portland Cement Co.[1]	Nov. 18	10	4¾	5⅛	
Pennsylvania-Dixie Cement Corp. (1st Mort. 6's)[29]	Nov. 21	100	98¾	98⅞	
Pennsylvania-Dixie Cement Corp. (preferred)[28]	Nov. 23	100	92	96	1¾% Sept. 15
Pennsylvania-Dixie Cement Corp. (common)[28]	Nov. 22	.....	22½	22½	50c Oct. 1
Petoskey Portland Cement Co.[1]	Nov. 22	10	11½	12¼	1½% quar.
Pittsfield Lime and Stone Co.[31]	Oct. 8	.....	.....	100	
Pittsfield Lime and Stone Co.[31] (common)	Oct. 8	.....	.....	25	
Riverside Portland Cement Co.	May 9	.....	165	.....	50c monthly, $1.50 ex. Aug. 1
Rockland and Rockport Lime Corp. (1st preferred)[34]	Nov. 19	100	101	.....	3½% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (2nd preferred)[34]	Nov. 19	100	40	65	3% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (common)[34]	Nov. 19	No par	.....	50	1½% quar. Nov. 2
Sandusky Cement Co. (common)[1]	Aug. 2	100	125	135	$2 quar. Oct. 1
Santa Cruz Portland Cement Co. (bonds)[5]	Oct. 20	.....	105½	.....	6% annual
Santa Cruz Portland Cement Co. (common)[5]	Nov. 18	.....	85½	.....	$1 quar., $1 ex. Jan. 1
Schumacher Wallboard Corp. (common)	Nov. 18	.....	21	21⅜	
Schumacher Wallboard Corp. (preferred)	Nov. 18	.....	25½	25¾	
Southwestern Portland Cement Co. (units)	May 11	.....	205	.....	
Superior Portland Cement, Inc. (Class A)[20]	Nov. 17	.....	49¾	51	
Superior Portland Cement, Inc. (Class B)[20]	Nov. 17	.....	30	33	
Trinity Portland Cement Co. (units of 1 sh. pfd. and ½ sh. com)[37]	Nov. 21	.....	154	160	
United Fuel and Supply Co. (sand and gravel) 1st Mort. 6s[27]	July 14	100	98	100	
United Fuel and Supply Co. (sand and gravel) 6% gold notes[27]	July 14	100	98	100	
United States Gypsum Co. (common)	Nov. 22	20	90	90½	40c qu. $1 ex. Dec. 31
United States Gypsum Co. (preferred)	Nov. 22	123	121	123	1¾% quar. Dec. 31
Universal Gypsum Co. (common)[3]	Nov. 23	No par	3½	4	
Universal Gypsum V.T.C.[3]	Nov. 23	No par	3	4	
Universal Gypsum Co. (preferred)[3]	Nov. 23	.....	30	40	1½% Feb. 15
Universal Gypsum and Lime Co. (1st 6's, 1946)[3]	Nov. 9	100	.....	96	
Union Rock Co. (7% serial gold bonds)[15]	Oct. 7	.....	Called as of Nov. 1, 1927		
Upper Hudson Stone Co. (1st 6's, 1951)[32]	Nov. 18	.....	97	99	
Upper Hudson Stone Co. (1st 6's, 1937)[32]	Nov. 18	.....	94	99	
Vulcanite Portland Cement Co. (7½% bonds, 1943)[32]	Nov. 18	100	105	109	
Whitehall Cement Mfg. Co. (common)[36]	Nov. 18	.....	150	.....	
Wisconsin Lime and Cement Co. (1st Mort. 6's, 1940)[15]	Nov. 9	100	99	101	
Wolverine Portland Cement Co.	Nov. 22	10	5¼	5¼	15c Nov. 15
Yosemite Portland Cement Co. (Class A, common)	Nov. 18	.....	7	.....	

QUOTATIONS OF INACTIVE ROCK PRODUCTS SECURITIES

Stock	Date	Par	Price bid	Price asked	Dividend Rate
Asbestos Corp. of America (5 sh. pfd. and 5 sh. com.)[1]	June 22	.....	$1 for the lot		
Atlanta Shope Brick and Tile Co.[1]	Nov. 24	.....	25c	.....	
Benedict Stone Corp. (cast-stone) (50 sh. pfd. and 390 sh. com.)[1]	Dec. 29	.....	$400 for the lot	.....	
Blue Stone Quarry (60 shares)[2]	Mar. 16	.....	$10¼ for the lot	.....	
Coplay Cement Mfg. Co. (common)[4]	Dec. 16	.....	12½	.....	
Coplay Cement Mfg. Co. (preferred)[1]	Dec. 30	.....	70	.....	
Eastern Brick Corp. (7% cum. pfd.)[1]	Dec. 9	10	40c	.....	
Eastern Brick Corp. (sand lime brick) (common)[1]	Dec. 9	10	40c	.....	
Edison Portland Cement Co. (common)[4]	Sept. 11	50	20c	.....	
Edison Portland Cement Co. (preferred)	Nov. 3	50	17½c(x)	.....	
International Portland Cement Co., Ltd. (preferred)	Mar. 1	.....	30	45	
Globe Phosphate Co. ($10,000 1st mtg. bonds, $169.80 per $1000 paid on prin.)	Dec. 22	.....	$50 for the lot	.....	
Iroquois Sand and Gravel Co., Ltd. (2 sh. com. and 3 sh. pfd.)[1]	Mar. 17	.....	$12 for the lot	.....	
Knickerbocker Lime Co.(x)	June 22	.....	100	.....	
Limestone Products Corp. (150 sh. pfd., $50 par, and 150 sh. com., no par)	Dec. 22	.....	$60 for the lot	.....	
Missouri Portland Cement Co. (serial bonds)	Dec. 31	.....	104¾	104¾	3¼% semi-annual
Olympic Portland Cement Co.(g)	Oct. 13	.....	.....	£1⅝	
Phosphate Mining Co.[1]	Nov. 24	.....	1	.....	
River Feldspar and Milling Co. (50 sh. com. and 50 sh. pfd.)[1]	June 23	.....	$200 for the lot	.....	
Rockport Granite Co. (1st 6's, 1934)	Aug. 31	.....	90	.....	
Simbroco Stone Co.[2]	Apr. 20	.....	12	12	
Southern Phosphate Corp.[6]	Sept. 15	.....	1¼	.....	
Tensas Gravel Co. (180 sh. com.)[1]	Nov. 17	.....	$1 for the lot	.....	
Tidewater Portland Cement Co. (3000 sh. com.)	Dec. 22	.....	$6525 for the lot	.....	
Vermont Milling Products Co. (slate granules) 22 sh. com. and 12 sh. pfd.)[6]	Nov. 3	.....	$1for the lot	.....	
Wabash Portland Cement Co.[1]	Aug. 3	50	60	100	
Winchester Brick Co. (preferred) (sand lime brick)[5]	Dec. 16	.....	10c	.....	

(g) Neidecker and Co., Ltd., London, England. [1]Price obtained at auction by Adrian H. Muller & Sons, New York. [2]Price obtained at auction by R. L. Day and Co., Boston. [3]Price obtained at auction byWeilupp-Bruton and Co., Baltimore, Md. [4]Price obtained at auction by Barnes and Lofland, Philadelphia, Penn. [5]Price obtained at auction for lot of 50 shares by R. L. Day and Co., Boston, Mass. (x) Price obtained at auction by Barnes and Lofland, Philadelphia, on November 3, 1925. [6]Price obtained at auction by Wise, Hobbs and Arnold, Boston, Mass.

Union Rock Bonds Offered

WILLIAM R. COMPTON, E. H. Rollins and Sons, Chicago, Ill., are offering $2,500,000 first mortgage 6% serial and sinking fund gold bonds of the Union Rock Co., Los Angeles, Calif., at prices of 100 for 1928 to 1932 maturities, 99 for 1933 to 1937 maturities and 98 for 1938 to 1947 maturities, accrued interest to be added. Due $60,000, September, 1928-46 inclusive and $1,360,000, September, 1947.

The following data are from a letter from George A. Rogers, president of the company:

Business and Territory.—Union Rock Co. produces, sells and distributes crushed rock, crushed and screened gravel and sand for use in the construction and maintenance of railroads, highways, streets and buildings, and of irrigation, flood control and reclamation projects. Its plants and bunkers are strategically located in that district of southern California of which Los Angeles is the center, and which has a present estimated population of about 2,500,000. In this territory the company supplies about 50% of the rock, gravel and sand market, and its volume of business is at least twice as large as that of its largest competitor. During 1926 the company marketed 3,800,000 tons of material; the estimated tonnage of products to be marketed during 1927 is 4,350,000.

Properties and Security.—Union Rock Company has 12 production plants, of which 11 are in active operation with an aggregate capacity estimated by the J. G. White Engineering Corp. at 2,150 tons of material per hour, and which the company has frequently demonstrated to have a capacity output for these plants showing an aggregate of 2,550 tons per hour. Six of these plants are located along the San Gabriel "wash" to the east of Los Angeles; one is on the Big Tejunga "wash" in the San Fernando Valley north of Los Angeles; three are on Santiago Creek near the center of Orange County and to the southeast of Los Angeles; and one is in Hollywood. The Hollywood property is the only real quarry operation conducted by the company and produces an

igneous rock called "trap." In addition, the company handles exclusively the sale of material from the Arroyo Seco plant of the Los Angeles Rock and Gravel Company, and from the Culver City sand pits.

In conjunction with its operations, the company owns 736 acres of productive land and leases 1,316 acres. In addition, 414 acres of land, subject to excavation, are owned by the company and held in reserve for future operations. The total remaining material contained in the properties controlled by the company either through ownership or lease, assuming a depth of excavation of 50 feet and after proper allowance for waste, aggregates over 219,000,000 tons. This prospective tonnage assures the company of a remaining life of at least 50 years, based on the estimated sales for 1927.

To facilitate the distribution of its products, the company operates 14 bunkers with a total capacity of 38,100 tons. Seven of the bunkers are built on land owned in fee while the others are on leased land. The company owns two advantageously located sites on which bunkers will be constructed as soon as local demand requires. The bunkers are all located at strategic points, so that there is seldom need to transport materials more than 5 miles to any construction job. While this distributing system is very valuable today, it is hardly possible to estimate its worth in a few years when this territory will become further congested. Through the network of railways owned by the Pacific Electric, Southern Pacific and Santa Fe companies, all production plants and bunkers are inter-connected, thus assuring rapid and relatively cheap delivery of materials to the various bunkers.

Besides the plant equipment, the company owns and operates 4½ miles of private railroad with necessary locomotive and hopper-bottom cars; steam shovels; locomotive cranes; and automobiles and trucks.

Capitalization: As given below:

(After giving effect to present financing)

	Authorized	Outstanding
First mtge. 6% serial and sinking fund gold bonds (this issue)	$5,000,000	$2,500,000
Pfd. stock, 7% cumulative (par value $100)	2,000,000	1,078,700
Com. stock (no par value), shares	30,000	30,000

Earnings.—For the four and one-half year period ended June 30, 1927, the company's annual net earnings after depreciation, depletion and amortization, but before bond interest and federal income taxes, have averaged $497,586, or over 3.30 times the annual interest requirements on first mortgage bonds of the company to be presently outstanding and over 2¼ times the annual interest, redemption and sinking fund requirements on said bonds. For the six months ended June 30, 1927, such net earnings were at the rate of over 5¼ times the interest requirements on bonds to be presently outstanding.

Security.—These bonds will constitute direct obligations of Union Rock Co. and will be secured by a first mortgage on substantially all of the land, leaseholds, plant, equipment and other property recently appraised for us by the J. G. White Engineering Corp. as having a value of $8,902,500, equivalent to $3560 for each $1000 bond to be presently outstanding.

Sinking Fund.—In addition to providing for the annual serial retirement of bonds, the trust indenture under which these bonds are to be issued will provide for annual sinking fund payments which, it is estimated, will be sufficient to retire all bonds of the present offering by or before September 1, 1947.

Purpose of Issue.—The proceeds from the sale of these bonds will be used to retire the present funded indebtedness of the company to liquidate certain purchase contracts, and for other corporate purposes.

ASSETS

Property—Sound values as reported by the J. G. White Engineering Corp.:		
Land, deposits, leases, etc.	$5,653,000.00	
Plant, equipm't, etc.	3,249,500.00	
Total property		$ 8,902,500.00
Securities owned (at cost)		56,711.49
Current assets:		
Cash	$539,818.23	
Accounts receivable	575,489.86	
Due from Union Rock Co. (Calif. corp.)	17,500.00	
Inventory of materials at bunkers (company's valuation; not verified under audit as to quantities)	58,656.39	
Total current assets		1,191,464.48
Deferred charges		267,472.73
Total		$10,418,148.70

LIABILITIES

Preferred capital stock, 7% cumulative (shares $100 each)		$ 1,078,700.00
Common capital stock (authorized and outstanding, 30,000 shares without par value		301,752.86
First mtge. serial and sinking fund bonds (interest at 6%)		2,500,000.00
Purchase contracts payable		100,975.40
Current liabilities:		
Accounts payable	$257,772.16	
Automobile truck purchase contracts	64,082.55	
Fed. inc. tax for 1926	30,725.28	
Total current liabilities		352,579.99
Reserve for federal income taxes		61,898.55
Deferred credit		1,645.40
Surplus (incl. $5,275,712.84 arising from revaluation of property assets)		6,020,596.50
Total		$10,418,148.70

Earnings of Union Rock Co. and its subsidiaries since the beginning of 1923, as audited by Messrs. Haskins & Sells, have been as follows:

EARNINGS OF UNION ROCK CO., 1923 TO 1927 (INCLUSIVE)

	Year ended Dec. 31, 1923	Year ended Dec. 31, 1924	Year ended Dec. 31, 1925	Year ended Dec. 31, 1926	6 months ended June 30, 1927
Net sales	$2,619,165	$2,399,018	$2,469,679	$3,509,233	$2,061,438
Net earnings before depletion, depreciation and amortization	855,441	587,247	431,535	845,262	584,140
Depletion, depreciation and amortization	134,306	161,655	255,042	325,390	188,094
Net earnings applicable to bond interest and federal income taxes	721,135	425,592	176,493	519,872	396,046

North American Cement Earnings

NET earnings of the North American Cement Corp., Albany, N. Y., after depreciation and depletion, available for interest for the month of September was $174,325 against $167,490 in August, both months being higher than any previous month but one in the company's history.

NORTH AMERICAN CEMENT CORP. EARNINGS

Period ending September 30	1927—3 Mos.—	1926	1927—9 Mos.—	1926
Net earnings after depreciation and depreciation available for interest	$453,690	$416,947	$696,002	$953,489

U. S. Gypsum Common Off 10 Points Over Dividend Action

FAILURE of the directors of the United States Gypsum Co. to declare an annual stock dividend, a policy in effect for the last eight consecutive years, was reflected in the market on November 9 by a break of 13½ points in the opening. A sale of 1500 shares at 86 compared with the close of 99½ on November 8 was recorded. In later trading the stock rallied to 91½, then steadied around 90½, the close being 89½, a net loss of 10 points on the day.

Predictions had ranged from 10% to 20% extra in common stock and from $2 to $3 extra in cash, but the usual dividend of 40 cents a share was declared, with only $1 extra. While no official statement was forthcoming at the company's offices, many brokers are of the opinion that the failure to vote the stock dividend should not be considered too pessimistically.

Announcement was also made that Melvin O. Traylor, president of the First National Bank of Chicago, had been elected a director and chairman of the finance committee of the U. S. Gypsum Co. The election of Mr. Traylor fills the vacancies left by the death of Ralph Van Vechten.—*Chicago Journal of Commerce.*

France Stone Company to Increase Capital Stock

THE France Stone Co. with general offices at Toledo and extensive holdings in Erie-co quarry interests, has, through its president, George A. France and secretary W. G. Sheub, filed with the secretary of state at Columbus, a certificate to amend the company's charter. The management asks permission to increase its capital from $700,000 to $2,000,000.

The certificate asks for permission to increase its shares of common stock from 7,000 to 10,000 of a par value of $100 and to increase its preferred stock of $100 from 1,000 to 10,000 shares.

When many acres of Erie-co land recently changed hands, it was first reported that the France company was the real purchaser of the properties.—*Sandusky* (Ohio) *Register.*

New England Lime Industry Active in Developments and Competition

Popularity of Pulverized Lime Favors Use of Rotary Kilns with Large Production

By John J. Landy
Assistant Editor, Rock Products

THERE is ample evidence that the northeastern section of the United States has kept pace with modern trends in the rock products industries. In fact with respect to lime producers in this section may well be considered in the fore. The contrast is strange—the oldest lime district in this country employing advanced equipment and ideas of manufacture. Not to say that there is no antiquated equipment, for there is and some of it is still in use but for the greater part most of the lime plants are pretty well modernized.

In brief amplification of the foregoing, it can be pointed out that the district is increasing its use of rotary lime kilns and pushing the manufacture of pulverized lime. The rotary kiln is highly successful in burning the limestone of the Stockbridge (Mass.) and Rockland (Maine) formations. Earlier types of shaft kilns were all short and wood-fired, for the stone required mild burning and also had a tendency to disintegrate in the kiln. With wood becoming scarce and expensive, the producers turned to a mixture of coal and wood or producer gas to give the mild burning and many of the shaft kilns are now fired in this manner. It was thus only natural that the final step should be the rotary kiln—the higher fuel ratio being more than overbalanced by the increase of capacity brought about and other economies such as machine breaking of the stone to rotary kiln sizes. The big factor, of course, in popularizing the rotary kiln has been the change in demand from lump lime to pulverized lime.

Pushing Pulverized Lime

The great increase of production of pulverized quicklime is due to many things, chief among which was the knowledge that New England lime was a plastic lime but had never really been advertised as such. Producers faced the problem of educating their buyers to using a pulverized quicklime in place of the usual lump lime and hydrate. How well they have succeeded can be readily seen—nearly all the plants in the district now marketing a pulverized lime.

It is not the purpose here to argue the question of the desirability of use of the pulverized product but all must admit it has some excellent selling points. First, it has no water on which to pay freight and second it cuts down the danger of "popping" in finished plaster work by a large margin. Regarding its use as a plastic finishing lime, the answer may be found in the recent experimental investigations by F. W. Adams* at the Mass. Inst. of Tech., Boston, Mass., and reported at the Lime Symposium at Richmond, Va., of which the conclusions are given in part:

"It has been found that in the hydration of a high-calcium lime (eastern lime) the size of hydrate particles may be decreased by decreasing the diameter of the quicklime particles. Thus, a finely ground quicklime will yield a more reactive hydrate, possessing a lower settling rate. While a quicklime particle of 10 mm. average diameter yields a hydrate, with the low plasticity figure of 147, indicating an inferior hydrate, by *reducing the size of quicklime particle to 5.0 mm. and below, the product may be classified as a finishing hydrate,* plasticity values running between 265 and 386. The putty volume is found generally to follow the plasticity figure, carrying between 137 and 180 cc. from 100 grams of hydrate."

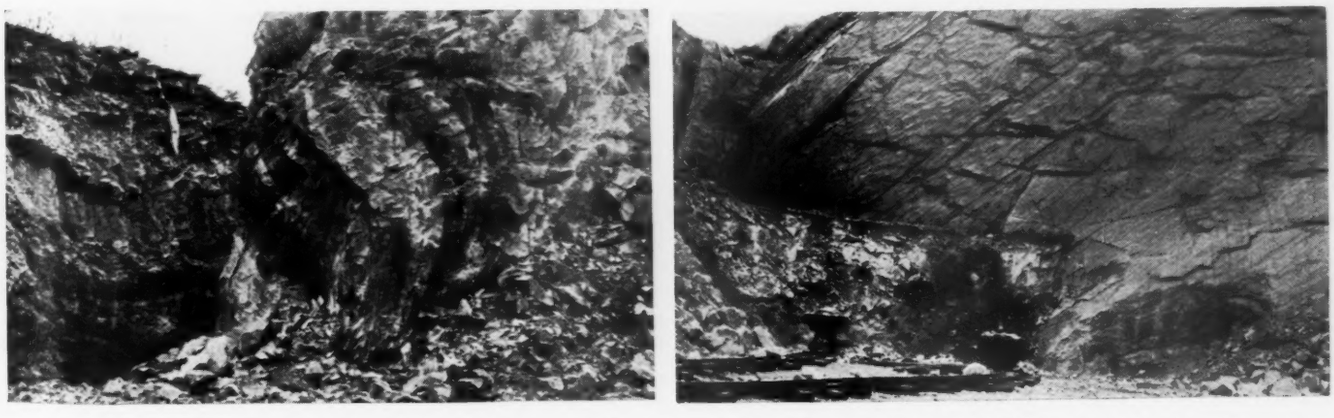
To go back one step further, viz., to the calcining of eastern limes, we quote from the work of †R. T. Haslam and E. G. Herman:

"The effect of time and temperature of burning on the properties of lime have been studied. Two limestones were used, one of eastern stone not usually considered to be capable of producing a plastic hydrate, and the other an Ohio stone that does give a plastic hydrate. It has been found that there is an optimum temperature and time of burning for the production of the most plastic lime and that these optimum conditions produce a very plastic hydrate from each limestone."

The eastern producer is undoubtedly aware of this technical progress, for nearly all have capable engineers or chemists in their em-

*"Effect of Particle Size on the Hydration of Lime," Rock Products, April 30, 1927.

†"Effect of Time and Temperature of Burning on the Properties of Lime," Rock Products, October 30, 1926.



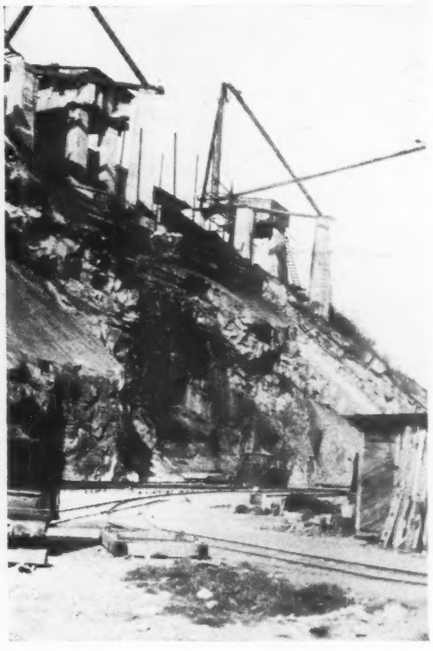
Broken and folded strata characteristic of the Stockbridge formation. The varied composition makes hand sorting for lime burning a necessity

ploy. It is then not surprising to find that the talk of plastic hydrates from New England limestone is not entirely unfounded—several companies are said to be marketing such products at the present time.

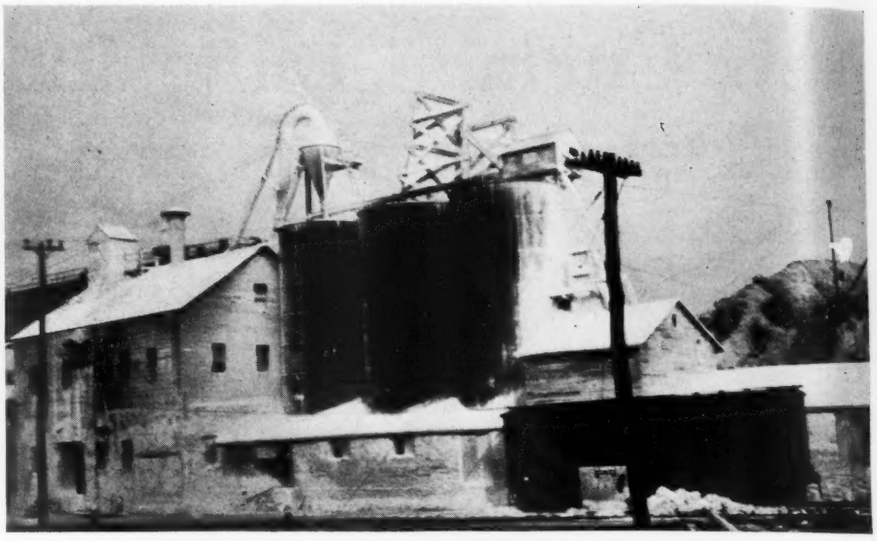
All the companies producing pulverized lime crush their product to different degrees of fineness, a condition probably based on experimentation by the individual companies to find the best particle size for their particular lime. The crushing and screening equipment also differs to some extent, although the hammer mill and vibrating screen predominate.

A Plant Old in New England's Lime Industry

The quarry of the Lee Lime Corp. at Lee, Mass., is a fair example of what can be expected in the way of stone from the Stockbridge formation. There are veins of magnesian limestone and high calcium limestone occurring side by side which make necessary hand sorting on the quarry floor. The quarry has been developed over a long period of years until it now has a face about 1000 ft. long and 65 ft. high. Two large quarry blasts are made each year, each dislodging from 40,000 to 50,000 tons of stone. On the floor of the quarry the larger pieces are sledged to kiln size and loaded on special all-steel quarry cars running on a 36-in. track. The loaded cars are drawn by a Plymouth 4-ton gasoline locomotive through a weigh house and to a position under the kilns. A boom derrick lifts the car body off the chassis and raises it to the top of the kilns where the stone is dumped. The derrick then returns the body to its original position on the chassis for further quarry loading. A two-drum Lidgerwood steam hoist operates the derrick and a small National steam hoist the bull-wheel of the derrick.

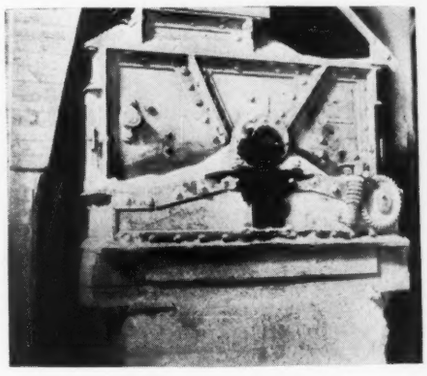


Derricks raising stone to the kilns, Lee Lime Corp.



Hydrate plant of the Lee Lime Corp., Lee, Mass.

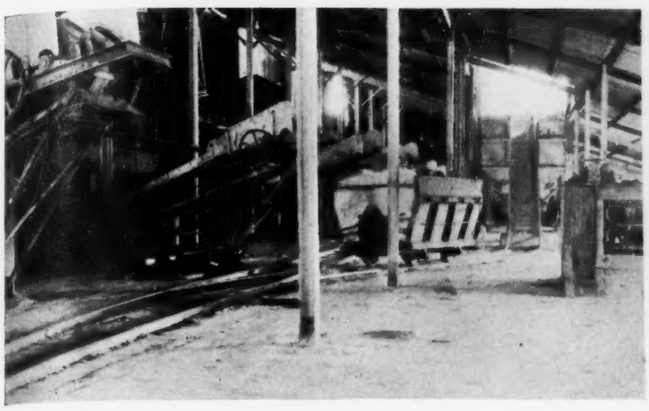
There are 10 kilns at the plant, each 30 ft. high and 14 ft. outside diameter. All are coal fired and equipped with the Eldred CO_2 recirculation system, three of the kilns furnishing the necessary CO_2 for the entire battery. The production is about 17 tons from each kiln every 24 hours, drawing being carried on at six-hour intervals. Each of the kilns is equipped with a Caldwell unloader, a form of pivoted Link-Belt pan conveyor, which takes the lime as drawn from the kilns and carries it to a large steel car of 5-ton capacity running on a track paralleling the kilns. This car is drawn up an incline to a rectangular Link-Belt cooler made of steel and equipped with bottom gates to allow the cooled lime to fall on a belt conveyor discharging on a sorting belt. From the sorting belt the lime passes over a scalping screen with 3-in. perforated steel plate opening, the throughs of which are carried to a small gyratory crusher and crushed to 1-in. and under. The lime passing the screen goes to a pivoted car loader or to storage as lump lime. The 1-in. lime is drawn from the storage bins and fed to a Kritzer hydrator and the hydrated lime passed to two Raymond mills, one making the usual mason's hydrate grade and the other a special and finer grade sold to the paper trade. The capacity of the hydrate plant is about four tons per hour, all of which is packed in 50-lb. paper sacks.



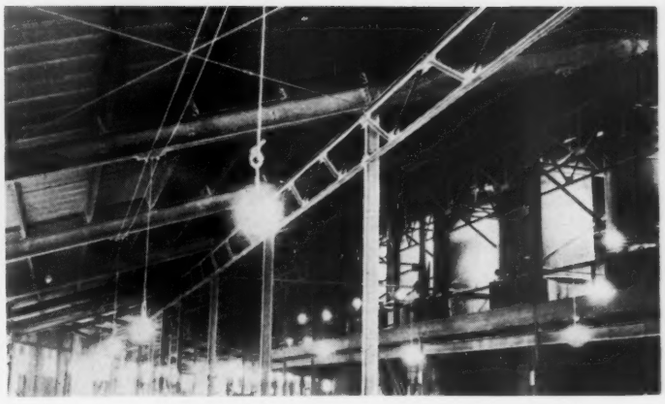
Hammer mills are favored for pulverizing the lump lime

At West Stockbridge, Mass., there are three large lime plants operated by three different companies. The rotary kiln plant of the Lee Lime Corp., formerly the Tobey Lime Co., has been described before in Rock Products, and there is the New England Lime Co. operation which consists of rotary kilns and shaft kilns. The third company, the Miller Lime Products Co., though new in name, is old in the locality. When first started by the Tobey Bros. it was called the West Stockbridge Lime Co.; the corporate name was later changed to the Clifford L. Miller Co.,

A part of the Lee Lime Corp. quarry—one of the oldest in the section



Drawing floor at the Lee Lime Corp. showing the kiln unloaders and cooling car



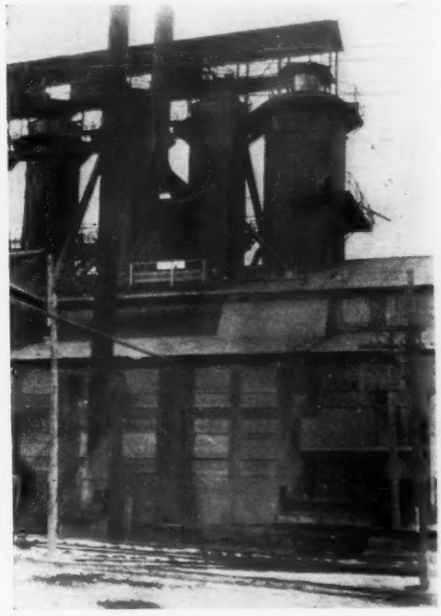
Looking along the firing floor at the Farnam-Cheshire Lime Co.

when sold to Clifford L. Miller and associates. After a reorganization, early this year, the present name was adopted.

An Unusual Quarry—Even for New England

The Miller company, as its name implies, produces a variety of lime products, including agricultural limestone, asphalt filler, terrazzo and stucco chips, facings and an imitation caen stone cement. The quarry is one of the most unusual in the country, containing beds of dolomite and high calcium rock, both in the same formation, so careful sorting has to be made for the kiln stone. Two openings are worked, one on the east of high calcium stone with interbedded dolomite and the other on the west, the beds of which vary greatly in composition. The stone from the west opening is being utilized to produce a lime which acts in a most unusual manner. This will be brought out a little further along in this article.

Several large blasts are made in each opening during the year. The blast holes are put down with a Denver No. 7 drill block-holing on the floor by a Sullivan jackhammer drill. The sorted stone is loaded on Koppel 2-yd. steel cars and 3-yd. wooden cars of the company's own design. The cars are drawn from the quarry by Plymouth 3-ton gasoline locomotives over trestles to the tops of the kilns. Each kiln has an individual trestle. There are two batteries of 30-ft. kilns, one of five of no special design, equipped with the Eldred CO_2 recirculating system and the other three of the R. K. Meade type. All use coal and are hand-fired and drawn. The drawing is at 5-hour intervals; the drawn lime falling to small cars under the draw shears and drawn up an incline to a picking table where it is hand sorted and carried to an elevator feeding a Pennsylvania SX3 hammer mill, belt driven by a 40-hp. General Electric motor, set to reduce to ¼-in. down. The final pulverizing is done in a Sturtevant emery mill to 30-mesh, 95% through 40-mesh. This is called "Flour Finishing Lime" and packed in 280-lb. wood or steel barrels. The plastering grade is material unsuitable for finishing lime and goes through the same pulverizing process. No mechanical screens or vibrating screens are used anywhere in the operation, their use considered unnecessary.

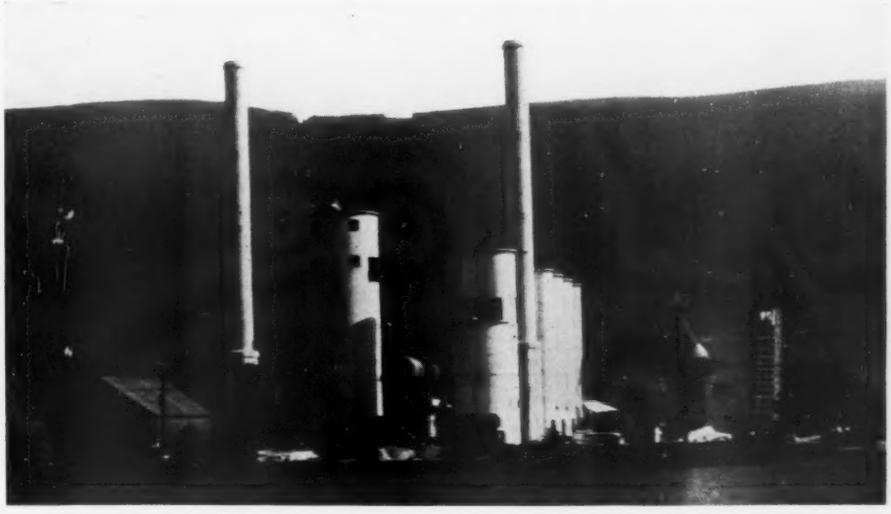


New shaft kiln (right) under construction at the Rockland-Rockport Lime Corp., Rockland, Maine

The pulverized finishing lime, as said before, is somehow different. It is yellow in color but changes to a pure white when made into a putty. Another peculiarity governing its use is noted in the directions packed with every barrel which are the exact *opposite* of those for slaking the Rockland-Rockport Lime Corp. "Failproof" lime. Here they are as given: Put at least 100 gal. water in box (for each barrel of flour lime) BEFORE PUTTING FLOUR LIME IN BOX. POUR LIME INTO THE WATER. DO NOT POUR THE FIRST WATER INTO THE LIME. (Add more water if needed after the boiling.)

A test of this "flour" lime was made before me and showed that it required between 3½ and 4 qt. of water to 2-lb. of lime to form a putty. The plasticity of the putty appeared to be quite good and the color white. Setting up of the putty occurred within a short time after it was made and more water then added and was absorbed without any great difficulty.

Two kinds of hydrate are made, mason's and agricultural. The former uses lime unsuitable for finishing lime and the latter is from run-of-kiln lime. Both kinds are produced in a Clyde No. 3 hydrator. The



The new Hoosac Valley Lime Corp. rotary kiln plant at Adams, Mass. The older shaft kiln plant shows at the right

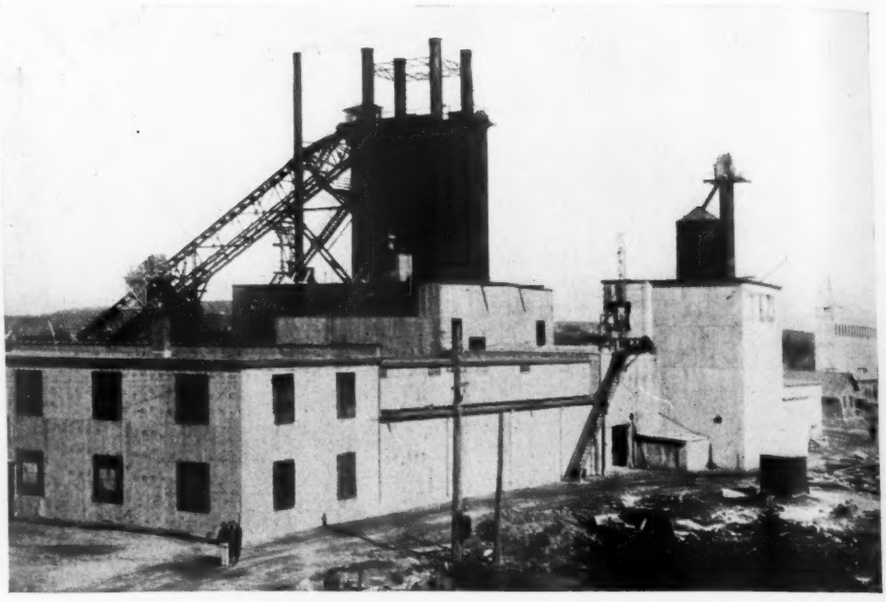
hydrate is carried from the hydrator by screw conveyor and elevator to storage bins from where it is then drawn as needed through a hopper to a Raymond feeder feeding a Raymond No. 00 mill equipped with air classifier. The mill is direct driven by a 10-hp. General Electric motor.

The rejected quarry stone and spalls are worked up into limestone products, although in some instances the dolomite stone is quarried for that purpose. An Austin No. 6 gyratory crusher, belt driven from a 100-hp. Allis-Chalmers electric motor, reduces the stone to 1½-in. and under. A scalping screen takes out the oversize and the throughs go to a Sturtevant No. 2 ring-roll crusher to be reduced to 15-mesh and under. The mill is connected in closed circuit with double-deck Newaygo screens, the top cloth being 15-mesh and the bottom 30-mesh. Oversize is carried back to the mill for further grinding, the 30-mesh collected for asphalt filler and the 15-mesh product for agricultural limestone. By passing the throughs from the 30-mesh screen over a Moto-Vibro vibrating screen, with 40-mesh cloth, two finer products are made, cast stone filler and limestone for the imitation caen stone cement. This cement is made from fine ground limestone, gypsum and color, the whole being mixer in a Broughton mixer and bagged in an open-mouth bagger. Shipments are made to all parts of the world.

The new officers of the Miller Lime Products are Clifford L. Miller, president; Fred A. Daboll, vice-president and general manager, and Hugh A. MacDonald, treasurer. Frank S. Wilson is general superintendent, D. F. Woodbridge, assistant superintendent, and T. E. McCarthy, quarry superintendent.

New Rotary Kiln Plant at Great Barrington

At Great Barrington, Mass., the Berkshire Hills Co. is putting in a new rotary kiln, 120 ft. long and 7 ft. in dia. with a 40x4-ft. dia. rotary cooler section. Changes at the quarry include a new Traylor gyratory crusher, a hammer mill for secondary crushing and the necessary conveying equipment. An unusual feature is the provision being made for a closed stone storage building 125 ft. long and about 50 ft. wide, divided into eight compartment bins and served by a conveyor from the crushing house. The bottoms of the bins are to be equipped with gates to pass the stone to a reclaiming hopper and rotary feeder and on to the reclaiming belt conveyor which feeds the rotary kiln. From the cooler the burned lime will be drawn by screw conveyor to a belt and bucket elevator, elevated and discharged on a horizontal belt conveyor running over the tops of three parabolic-bottom steel bins which are to serve as lime bunkers. The bins are covered and equipped with bottom gates through which the lime is drawn for shipping or packing. Space has been provided in the bin housing for a fourth bin section to be added when the second rotary kiln is installed, sometime in the future. Stephens - Adamson Manufacturing Co., Aurora, Ill., is in charge of the engineering and design.



Two-kiln lime plant at Thomaston, Me., now operated as the lime department of the Lawrence Portland Cement Co.

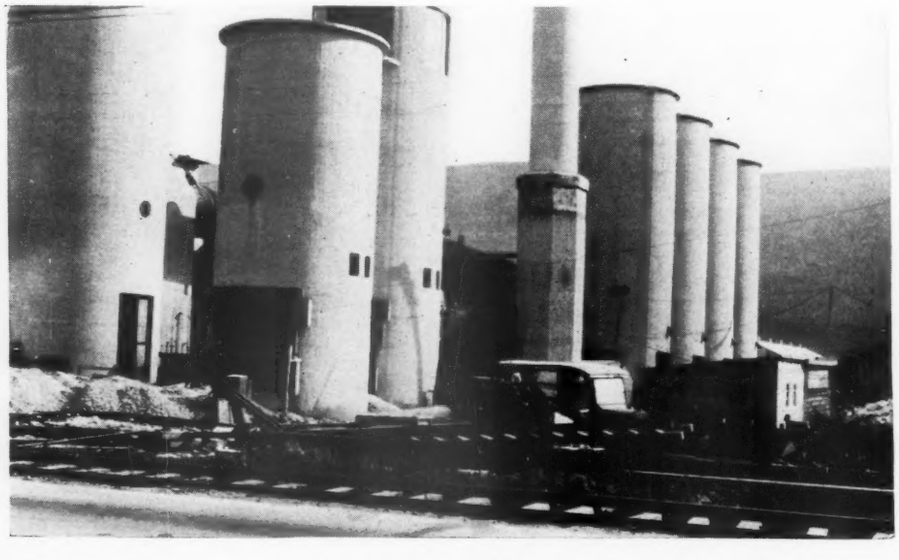
Hoosac Valley Plant Almost Completed

Another new rotary kiln plant, that of the Hoosac Valley Lime Corp., at Adams, Mass., is now almost completed. There are two Traylor kilns, each 150x8 ft. dia. with a 50x6 ft. rotary cooler. Firing will be by oil, for which purpose two 150,000 gal. steel storage tanks have been erected. All the structures are of reinforced concrete and include three rock storage and one lime storage silo. The quarry is being improved and a Traylor gyratory crusher for initial crushing installed nearby. A more detailed account of the plant progress will be given in an early issue.

The old shaft kiln plant of the Hoosac company is adjacent to the new rotary kiln plant under construction. There are four kilns, all wood-fired, with a total production of about 200 180-lb. bbl. per day, most of which is crushed to the grain size by a K-B pulverizer. This granular lime is typical of much of the product produced at other plants.

The New England Lime Co. has a battery of four rotary kilns at Adams and also a hydrate unit from which the plastic New England hydrates are said to emanate.

The Farnam-Cheshire Lime Co. is one of the oldest and largest producers in the district, its history dating back to just after the Civil War. The first kilns were pot kilns which were replaced in 1877 by shaft kilns and after the formation of the present company in 1904, the entire plant was changed and modernized. At the present time there are 21 kilns producing a total of



Commercial stone storage silos (left) and kiln stone lime storage silos (right background) at the new Hoosac Valley Lime Corp. plant, Adams, Mass.

about 250 tons per day. These are divided into two batteries, one of six kilns fired with either gas, coal or wood and the other of 15, six gas-fired and the remainder burning a wood-coal mixture.

New Lime Plant and Cement Mill at Rockland, Me.

There are several points of interest about Rockland, Maine. First there is the new lime plant of the Lawrence Portland Cement Co. at Thomaston, one of the most modern plants to be found anywhere in the United States. The two kilns are coal-fired, Schaffer shaft kilns of the semi-automatic type, each of which produces from 45 to 50 tons of lime every 24 hours—putting them among the largest shaft kilns in the country. The buildings are large, well-built of concrete, steel and corrugated iron siding and contain equipment of late design in all departments. This plant's features will be brought out in more detail in a forthcoming issue of Rock Products.

The new cement mill being built by the Lawrence company is nearing completion. All the principal mill buildings are up and machinery being put in place. The wet and dry compeb units have been installed and also the kilns and coolers. This plant will have two short kilns, 200x11 ft. dia., with allowance for waste heat installations whenever power costs rise to a point where they are economical. The design also permits future installation of slurry filters. The office building and machine shop are quite completed and in use and the same is true of part of the storehouse. Initial capacity of the mill will be about 3000 bbl. per day.

Rockland-Rockport Lime Corp. Makes Improvements

The Rockland, Maine, lime plants of the Rockland-Rockport Lime Corp. are quite familiar to Rock Products readers, having been the subject of several previous articles. Some improvements have been made in the operation of the coal-fired kilns, notably the installation of Ward stokers on one kiln for test purposes. A new kiln is being built which has in its design several ideas of Ernest Packard, superintendent, and George Wood, president of the company. The height is 64 ft. from the firing floor and the outside diameter 14 ft. The four fire boxes are to be equipped with Ward stokers. Eight peep holes have been arranged in such a fashion that a poke bar inserted in them can only poke along the kiln sides, the theory being that the center of the kiln gives little bother from hanging. The draw shears, of the company design, are operated through a chain fall and permit the kiln to be drawn in four places, each independent of the others. The advantage of this device is to permit the kiln operator to draw any side or sides of the kiln and thus encourage more regularity in burning.

The Rockport kilns of the company have been abandoned and the plant is now being dismantled. The equipment is being brought to the Rockland plants.

The new method increases the cost of production to the company approximately 20% over former methods, but insures a quality of sand that meets the critical tests of Missouri's highway department and various industrial projects.

The company produces annually 75,000 tons, operating five barges, one river steamer and three derricks of two yards capacity each. Their annual payroll approximates $35,000 to $40,000 and they have $100,000 invested in their plant.

The company has tendered sufficient sand to the Buchanan county court, free, to construct a mile of county highways as an experiment. The offer has been accepted and County Engineer Leslie has selected the Pickett road, where traffic is heavy. If the experiment proves successful, many of the county's minor highways can be paved at a minimum cost. This will make all-weather roads of many roads that at present become quagmires after rain or snow.—*St. Joseph* (Mo.) *Gazette.*

New cement mill of Lawrence Portland Cement Co. at Thomaston, Me.

Missouri River Sand Producer Installs New Dredge

THE Pioneer Sand Co.'s new dredging outfit, recently installed at a cost of $21,000, has recently been put into service at St. Joseph, Mo.

The new dredge takes material from the Missouri river and by an automatic process washes and classifies this material, eliminating all dirt and other foreign matter.

The essential feature of the unit is a centrifugal pump that lifts the material from the river bed to a fan-shaped spreading table on the dredge. The sand and water pass through a screen before discharging on the table. The sand is then spread out in a thin layer as it flows toward the lower and wider end and is received on an inclined screen, where fine sand is washed to the river and material over 14 mesh is spouted to barges.

The plan was developed by Capt. R. J. Stewart, who derived a similar model for land operation. Later it was worked out by him for floating equipment.

The Pioneer company's other operations consist of towing loaded barges, at times a distance of 12 miles, to the docks at the foot of Francis street, where they are unloaded by huge clam-shell cranes to cars, yard storage and trucks.

Modern construction of highways and industrial buildings requires a better quality of materials and sand today is keeping pace with the demand of engineer, architect and contractor.

Structural Gypsum Corporation Plans New Plant

AT a recent interview at New York, G. Lester Williams, president of the Structural Gypsum Corporation, confirmed the substance of the news items which have appeared recently in several of the New York financial papers, to the extent of stating that the Structural Gypsum Corporation has sold privately, $750,000 of its Class A preferred stock, and that none of this stock will, for the present, be offered to the public.

Mr. Williams stated that the proceeds of this financing will be used in part for the expansion of the corporation's manufacturing facilities, including the construction of a new plant in the vicinity of New York for the production of a diversified line of gypsum products of the synthetic gypsum process. It is expected that ground will be broken for this new plant not later than November 15th.

Mr. Williams also stated that in spite of the recession in general building which has become apparent during the past few months, the Structural Gypsum Corporation's present plant at Akron, N. Y. is still operating as it has been for the past two years, at 100% capacity.

Ohio Holds a Safety Congress

Cement and Quarry Industries are Well Represented at Columbus Meeting

AT the All-Ohio Safety Congress held at Columbus, Ohio, in the Neil House, on November 9 and 10, there was much discussion of interest to the rock products industry, both in the general session which was held on the first day and in the special mining and quarry section which met on the second day of the congress. It is to be noted that in the general meeting, men who are prominent in our industry took an important part in the program.

The first session was opened by the chairman of the meeting, Thomas P. Kearns, superintendent of the Division of Safety and Hygiene, Industrial Commission of Ohio. An address of welcome was made by the mayor of Columbus, James J. Thomas, and was followed by a talk by Governor Vic Donahey of Ohio. Mr. Donahey stressed the work of the Ohio workman's compensation law, stating that at the present time the state was protecting 1,500,000 men under this compensation law.

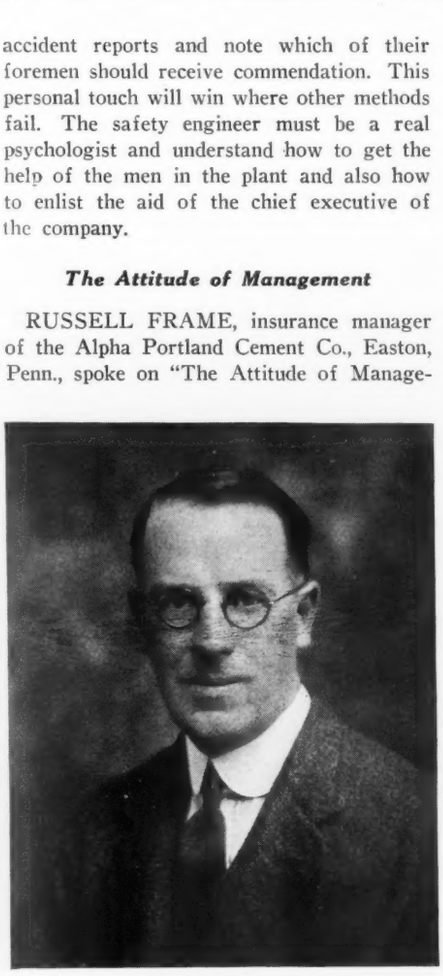
Ohio Compensation Law

P. F. CASEY, chairman of the Industrial Commission of Ohio, pointed out that safety work is a problem of the industry as a whole. The state, through the compensation law, cannot force an employer to do all in his power to promote safety, but the law does provide that a lax employer will bear a greater burden, should there be an accident in his plant. Many industries have cut down the rate they pay the state for compensation by cutting down the number of accidents, since the rate charged is based largely on the accident probability. In other words, the compensation law does not make the employer provide safety measures, but it makes it cheaper for him if he does, and at the same time it gives him the satisfaction of knowing he is contributing to the welfare of his men if he complies with the regulations of the commission.

Many of the talks were of value to men in the rock industry, although they were given by men outside our line of work. C. R. Hook, vice-president of the American Rolling Mill Co., Middletown, Ohio, spoke of the responsibility of executives and superintendents to promote the safety program, a matter which certainly is as important in a quarry or cement mill as it is in a rolling mill. He emphasized particularly that the executive must see that the safety movement reaches the men first hand, for second-hand information has little effect on employes. Executives should take time to commend a foreman who has done particularly good work in this line. They should analyze accident reports and note which of their foremen should receive commendation. This personal touch will win where other methods fail. The safety engineer must be a real psychologist and understand how to get the help of the men in the plant and also how to enlist the aid of the chief executive of the company.

The Attitude of Management

RUSSELL FRAME, insurance manager of the Alpha Portland Cement Co., Easton, Penn., spoke on "The Attitude of Management." Mr. Frame has had considerable experience in safety work, having been chairman of the Cement Section of the National Safety Council. In his talk he stressed especially the point that the attitude of the management is reflected in the attitude of the men. If their response is lukewarm, then the safety movement in that plant will also be lukewarm, and if they are behind the program whole-heartedly the record of the plant will certainly be good. Mr. Frame pointed out that as a mere business proposition, safety was worth while because it cut down compensation rates, attracted the better class of workmen to the safe plant, and unquestionably increased production. The safety program is an aid to all concerned, for it benefits the employe and cannot fail to pay dividends for the employer. The management must be the source of the program because it cannot come up from the men. Executives can see that first aid stations are provided, can set up bulletin boards, can have their plants join the National Safety Council and benefit by its meetings, can see that picked employes attend meetings of the National Council and the regional sessions, can stir up the interest and enthusiasm of their foreman, and finally reach the men themselves through competitions and similar means. When such a program is carried out, the executive can feel that he is really doing his part for safety. It was just along such lines that the Portland Cement Association worked in carrying out their very successful safety program. Mr. Frame called attention to the work of the association as an example of what could be done through reaching the executives and, through them, the workmen. Concluding, he said that the human interest, the personal element, was the dominant factor in bringing about safety in any plant.



Russell Frame

GEORGE HODGE, of the International Harvester Co., Chicago, spoke of the problems which come up after the management has done all possible to mechanically safeguard the worker. Beyond that comes "mental safeguard," but that is something that is up to the men themselves. Certain it is that they will not practice mental safety when the employer does not provide mechanical safety. Assuming that the executive has provided all safety appliances necessary, the next step is to educate the men. The best means is through the foreman and through the safety committee. The latter is useless unless the message is carried back to the men, but the foreman is with his men all the time, and he is the best medium to work through. Speaking of another feature, Mr. Hodge said he could not stress too greatly the use of safety symbols at plants. The safety flag, of course, is well known and has always proved an inspiration for "no-accident" competitions. That other ideas are equally effective is shown by one plant which posted a large picture of a mule above their bulletin board, and a brown strip was posted on the picture for a no-accident month, while a black strip was posted for a month having one or more accidents. The object was to keep the mule from turning into a zebra. Finally, Mr. Hodge pointed out the free interchange of ideas between management and men was one of the most essential things in a successful safety program.

MARCUS B. DOW, past president of the National Safety Council, made a short talk on the change in attitude toward safety since the first safety council in 1911, when only 50 delegates were present, comparing that with the late council in Chicago when more than 5000 were present.

Organizing for Safety in Small Plants

A. V. WILKER, works manager of the National Carbon Co., Cleveland, Ohio, spoke on "Organizing for Safety in Small Plants." He gave a very constructive program for the organization of safety work, as follows: (1) The attitude of the management must be made right. (2) The plant must be adequately safeguarded mechanically. (3) A physical examination of all employes is necessary. (4) A general cleanup of the plant should be made. (5) A safety committee should be formed. (6) A definite program of education and strict set of safety rules must be prepared. With such a program any plant should go far towards a safety record. Some other helpful ideas were given by Mr. Wilker, such as the point that guards should be designed for machinery when the machine itself is designed, a safety manual should be prepared for employes, new employes must be made thoroughly conversant with the work which is expected of them, and the foremen must be taught to "sell" safety to their men.

J. A. OARTEL, chief of the Safety Bureau of the Carnegie Steel Co., spoke on the responsibility of the foreman, emphasizing the point that the plant with the best cooperation between foreman, executive and workman has the most safety. He said he had attended a foremen's meeting at which

E. E. Evans

the following question was discussed: "Is the law of self-preservation enough to keep the plant safe?" The conclusion reached was that it was not. Certainly the foremen understood their problem and were correct in their conclusion, for if self-preservation was sufficient there would be no need for a safety movement of any kind. Unquestionably that is an example of the understanding which the men have of the problem and shows how easy it actually is to work with them.

The concluding paper of the first day was given by W. E. CONLEY of the National Lamp Works, of Cleveland, and stressed the vital part lighting plays in the accident prevention work of today. Mr. Conley stated that 25% of all accidents in industrial plants are caused directly by poor lighting conditions.

Quarry Section

The quarry section of the congress met on the morning of November 10, with E. E. EVANS, president of the Whitehouse Stone Co., Toledo, presiding. In opening the meeting Mr. Evans called attention to the work of the Ohio quarrymen both in local safety work and in the national movement. Three years ago the Ohio producers got together and held a safety meeting at the National Safety Council. From that modest beginning grew out the quarry section of the council, a section which was one of the largest at the September meeting in Chicago. The Ohio quarrymen also had considerable to do in pointing the way for the National Crushed Stone Association to take up the safety movement. Mr. Evans pointed out the necessity of effecting a permanent organization for the group, and an election was held at which the following men were made officers for the coming year: Chairman, E. E. Evans, Whitehouse Stone Co.; vice-chairman, Walter Robinson, operating vice-president, Youghiogheny and Ohio Coal Co., Cleveland; secretary, D. C. Ranville, Southwestern Portland Cement Co.

Workmen's Compensation

H. H. HAMM, assistant secretary of the Cleveland Builders Supply and Brick Co., in speaking on the relationship between the safety movement and the workmen's compensation laws, pointed out that the two have much in common. The enactment of such laws focused the attention of employers on this important phase of their work, which heretofore had been entirely neglected. Mr. Hamm outlined the history of the Ohio law from the time it was first passed in 1911, when, although not compulsory, 3000 employers came voluntarily under the act, up to the present time, when the Ohio law is considered a model for other states to use as a pattern. The 1923 law took away the right of the men to sue, but made the employer liable for greater indemnity should it be proven that he was lax in his efforts for safety. This does away with the expensive lawsuits, and at the same time makes the employer an ardent safety first worker, if for no other reason than that to do so is the surest means of saving money. Mr. Hamm pointed out that the cost of safety work should not be considered as money thrown away for nothing, but should be included as a logical and equitable part of the production costs.

Safe Practices in the Cement Industry

A. J. R. CURTIS, assistant to the general manager of the Portland Cement Association, told of the progress made toward safety in the cement industry and the part played by the Portland Cement Association in bringing about this progress. In cement production, as in all other lines of industry, the safety movement was an outgrowth of the

A. J. R. Curtis

introduction of modern machinery, which, because it speeded up work, also brought about an increase of accidents. When the movement started the efforts were aimed toward eliminaing accidents by making machines mechanically safe with guards. Then when this did not make the industry safe, a great many safety rules were adopted, but these did not completely eliminate the accidents. The final measure, which was largely successful, was in reaching the men themselves and gathering statistics on accidents in order that similar hazards could be done away with. Mr. Curtis believes that 95% of safety work is in teaching the men that they and their families are the ones that suffer from an accident, and that the company does not suffer much, even though it may be genuinely sympathetic at the time. To teach the men this, the association enlisted the aid of all executives and got them to send representatives of the men to the regional safety meetings, as well as to push the work in their own plant. The association also sends a magazine to the workmen at their homes (it is sent to the homes so the families will see it, and it will be generally discussed). Another paper which the association gets out goes to the plant executives, and details the accidents of the preceding month. By pointing out where the hazards are, the sheet shows what practices must be eliminated and is a great aid to the movement. The association has endeavored to bring about safety through two

means—co-operation and competition. The June drive was a good example of the former, when 133 plants went through a whole month without a lost-time accident. The various contests for trophies are examples of competition used successfully by the association. Much of this good work in the cement industry is due entirely to the strong central organization which acts as a clearing house for ideas, statistics and suggestions, and which has the opportunity to push forward its safety measures. In closing, Mr. Curtis called attention to the good work that was being done by the safety committees of the different plants, saying that besides their primary object of promoting safety, they were also bringing about a better morale in the plants and as a by-product were actually making the community a better place to live in.

Safety as the Biggest Job

C. B. HUNTRESS, assistant to the executive secretary of the National Coal Association, spoke of "The Biggest Job in the World." He pointed out that the triangle of safety—education, engineering and enforcement—was the foundation on which the safety movement must be built whether it be in mine or quarry. And of these three, education is the most important, for engineering work and mechanical devices cannot make a plant foolproof, nor will rules prevent a man from carelessness. The men must be taught not to take chances with their luck, and when they have this principle instilled in their minds they should go on and teach others.

The quarry section was closed by a first aid demonstration by Jay Thompson, secretary of the Toledo Safety Council.

Quarry Section Delegates

Some of those present at the quarry section were: D. C. Souder, France Stone Co.; Robert H. Pausch, secretary, Marble Cliff Quarries Co., Columbus; R. W. Bowen, Marble Cliff Quarries Co.; John Hines, superintendent, National Mortar and Supply Co., Springfield, Ohio; F. J. Wertel, superintendent, National Mortar and Supply Co., Gibsonburg, Ohio; Wm. L. Patterson, mine superintendent, Alpha Portland Cement Co., Ironton, Ohio; E. C. Rogers, Grasselli Chemical Co.; C. L. Clark, Ohio Crushed Stone Association; W. E. Hessman, superintendent, Luckey Lime and Supply Co., Luckey, Ohio; John Work, manager, Hughes Granite Co.; J. L. Reeves, assistant manager, Oliver Silica Sand Co., Massillon, Ohio; L. D. Koontz, plant superintendent, France Stone Co.; P. A. Mori, assistant production manager, Cleveland Stone Co.; C. A. Briggs, safety engineer, Woodville Lime Products Co., and W. L. Shirff, superintendent, France Stone Co., Dunkirk, Ohio.

Labor's Viewpoint

JOHN P. FREY, president of the Ohio Federation of Labor, spoke on "Labor's Views on Accident Prevention" at the general session in the afternoon of November 10. He stressed the good work done in furthering compensation laws by labor and employers getting together, with a true spirit of co-operation. Mr. Frey added a word of praise for the work of the safety engineers, saying that their trained minds have done much to push the safety work. The safety movement has a threefold object, he asserted—humanitarian, social and economic. To attain this triple goal, the employer and the workmen must get together and work out their problems with mutual confidence and co-operation.

DR. OTTO P. GEIER, speaking on the employer's view of accident prevention, agreed with Mr. Frey that mutual understanding was the basis of all safety work. When th etwo groups get on common ground, success and safety are certain to follow naturally, he said.

Industrial Health

DR. C. D. SELBY, past president of the Ohio State Medical Association, pointed out that a workman is valuable to his employer in direct relation to his interest, his knowledge, and his physical ability. Saying that disease prevention is a sure way of cutting down accidents, Dr. Selby pointed out that the same organization which works to stop accidents could work to prevent disease. He suggested that the plant physician ought to make it his duty to do the following: (1) Study the operation to discover harmful practices. (2) Conduct physical examinations for all employes. (3) Work with the superintendent to place men where they are best suited. (4) Give health instruction. (5) Make inspection of sanitary conditions. (6) Eliminate unhealthful practices. (7) Procure rest and recreation facilities. (8) During epidemics, examine all employes frequently. (9) Inspect plant restaurants. (10) Aid with dental work. (11) Help in rehabilitation of employes partially disabled. (12) Advise employes on social and financial matters (this is outside of his purely professional work, but the doctor frequently has such opportunities). (13) Work with the national and state organizations to promote industrial health. It is certain that when such work is done by the plant physician, a long step toward accident prevention as well as industrial health will be made.

There is no question but that such meetings as this All-Ohio congress are a great benefit to the safety movement in the United States. That more than 2000 men and women from one state alone should come together to discuss their common problems of safety clearly shows how vital a thing it is in their minds. Significant enough is the fact that, although much stress was laid on workman's compensation by the speakers, the motto of the Ohio Safety Congress is, "Safety is better than compensation." Employers and employes both recognize this fact and both were present at the meeting to push the movement with a genuine spirit of co-operation and mutual understanding.

The National Slate Association Meets January 17 and 18

THE call is out for the annual meeting of the National Slate Association to be held in New York, January 17 and 18, at Hotel Commodore. It is hoped that the meeting will be fully attended for the notice says:

"Special provision is being made for the presentation and discussion of problems of particular interest to all factors. This is to be the turning point in this Great Industry. Those who expect to keep posted on the trend of affairs within the industry, cannot afford to miss a minute of the coming meeting.

"All Producers, Distributors, Roofers and Setters, whether or not they are members of the Association, are most cordially invited to attend these conferences.

"There will be a special exhibit by the Associate Members the Hosts Club, to illustrate the newest development in equipment and supplies used by slate quarries and mills, and local slate roofers and setting contractors."

Requests for reservations should be addressed to the office of the Association, Drexel Building, Philadelphia, Penn.

Safety Manual Prepared by Associated General Contractors

THE Associated General Contractors of America have recently published quite a comprehensive work on the prevention of accidents under the title "Manual of Accident Prevention in Construction." The book is 50 pages in length and covers safety measures in all fields of construction and operation. The major portion of the manual is made up of the rules for "Safe Practices on Construction Work" compiled by the Detroit chapter of the Associated General Contractors. These rules are coded or cross-referenced so that it is a simple matter to find all the material included in the book concerning any particular practice or operation, and yet there is no unnecessary duplications. Included in the rules are sections on explosives, hoists and derricks, handling material, scaffolding, boilers, hand tools, excavation and fire prevention.

The manual also contains material concerning questionnaires to be filled out by employes as a part of the safety campaign, and data on reports by member companies to the general association. The latter part of the book is taken up with the handling of accident statistics by the general association, including typical forms for the classification of accidents, summaries of accident reports and reports of accident averages. The whole subject of safety methods is covered very well in a clear and concise style and the book is well worth the attention of men in quarry work, cement plants and any other branch of the rock products industry.

Portland Cement Association Celebrates 25th Anniversary

THE Portland Cement Association's annual meeting, at Chicago, Ill., November 14-16, was the 25th anniversary of the founding of the organization in 1902. Only three or four men, however, who attended the first banquet in 1902, were present on the evening of November 16, 1927, at the 25th banquet. Death has already removed most of founders.

In his presidential address, G. S. Brown stressed the need of expanding the demand for portland cement to keep pace with the increasing producing capacity of the industry. While this year's consumption of cement will probably be but little more than in 1926, there is a feeling that the industry is stabilized at about the present annual consumption, and while consumption may not increase very much in the near future, there is not much danger of a decrease.

The principal speaker at banquet was Col. George T. Buckingham, attorney of Chicago, who spoke eloquently against "government in business."

Marquette Cement Co. to Double Storage Capacity at Cape Girardeau

THE Marquette Cement Manufacturing Co., Chicago, has started on the construction of 16 new storage bins at its plant at Marquette, Mo., near Cape Girardeau. The new silos will have a total capacity of approximately 165,000 bbl., which will about double the present storage capacity at the mill. At present, 1600 piles are being driven for the foundations, and the work on the superstructure will go ahead shortly. It is expected that the new silos will be finished by March 1, 1928.

Plan Texas Cement Mill to Use Oyster Shells

ANOTHER cement mill in Texas to use mud-shells is reported to be planned for Aransas Pass, near Corpus Christi. A contract has been signed by W. J. Tucker, state game, fish and oyster commissioner and by the backers of the new project, Fred Robertson, Los Angeles and Coy Burnett, San Diego, by which a royalty of 4 cents a ton will be paid to the state for the shells. The abundance of the shells along the Gulf coast, and the proximity to the deep water parts at Ingleside and Corpus Christi will make the plant well situated both as to raw material and distribution of its product. The cement plants at Houston are now the only mills in the state using mud-shells.

A minimum of 100,000 tons of shell must be used annually by the new company and within three years it must begin and continue operation of a plant turning out not less than 1,800 barrels of cement daily, according to the terms of the contract. Burnett and Robertson have deposited $5,000 with the state and will pay $1,000 annually for three years until the contract is complied with after which the money will be applied on shell purchases.

Brazilian Quarries Leased

IN connection with the $150,000,000 program for building public works in Argentina it was announced recently that a contract had been signed by the State of Rio Grande do Sul leasing to the Argentine subsidiary of the Pan-American Industrial Corp. for a term of 25 years, two Brazilian stone quarries, known as Monte Bonito and Capao do Leao, both owned by the Federal Government of Brazil and operated by the State of Rio Grande do Sul under a contract expiring in 1973. Almost the entire output of these quarries, which have a total area of 374 acres, will be used during the next few years in programs of road construction in the Argentine.

Lots of Building Looked for in New York This Winter

THE WINTER and following spring, at least, are going to be periods of great building activity if records made available to the *Dow Service Daily Building Reports* by the New York Structural Steel Board of Trade at a recent date, prove to be as reliable as they have been in the past.

Charles L. Eidlitz, chairman of the board, shows that the records of his office for the month of October, covering the delivery of structural steel to building construction operations only, and strictly eliminating bridges, viaducts, etc., in the metropolitan district of New York reached the highest totals since its organization, and even exceeds the highest peak heretofore attained, in March, 1926, which, as is well known, was followed by the greatest period of building construction activity this city and vicinity has ever experienced.

"Starting with a low spot in January, 1927," continues Mr. Eidlitz, "there was a steady rise, which, however, dropped off in May and promptly returned to the January level. It then increased in June, but in July it once more reacted to the low point. August, September and October, however, have gone steadily ahead, October giving the highest delivery record in two years.

"New work, which ran unusually heavy during the first seven months of 1927, shows a decided falling off in the last three months, but attention is called to the statement of the United States Steel Corporation that its subsidiaries last week operated between 70% and 71% of their plant capacity, the first time that the 70% level has been touched since September."

Dewey Portland Plans Addition to New Plant

ANNOUNCEMENT of plans to erect a $300,000 addition to the Dewey Portland Cement Co. plant at Buffalo, Iowa, near Davenport, was made recently. The improvement will include the addition of a third kiln, and will increase the production from 3,000 to nearly 5,000 bbl. of cement a day. The plant at Buffalo was only completed a few months ago, and this addition will bring its cost up to $3,000,000. Herbert I. Tyler is manager of the new plant.

The Dewey plant is near the site where the Davenport Cement Co. is reported to be intending to erect a mill next spring at a cost of $1,500,000.

Kelley Island Stockholders Approve 4:1 Stock Split-Up

STOCKHOLDERS of the Kelley Island Lime and Transport Co. have approved changing the authorized common stock from 80,000 shares par $100 (77,238 shares outstanding), to 400,000 shares of no par value, four new shares to be issued in exchange for each common share held. It is expected that dividends at the rate of $2.50 per annum will be inaugurated on the new stock. This is equivalent to $10 per annum on the old common stock, which rate has been paid during the current year as well as the previous year.

Germans Raise Standards on All Cements

THE Minister of Transportation issued the following on October 15, 1927:

With the approval of industrial organizations and scientific societies of the German cement industry, the minimum strength values, contained in Section VII "Strength" of the German specifications for uniform delivery and tests of portland cement, iron portland cement and slag cement, were raised and established as follows:

1. ORDINARY PORTLAND CEMENT, IRON PORTLAND CEMENT AND SLAG CEMENT

	After 7 days (1 day moist air, 6 days under water)		After 28 days (1 day moist air, 27 days under water)		After 28 days (1 day moist air, 6 days under water, 21 days air)	
Mixture 1:3, lb./in.²	1909	1927	1909	1927	1909	1927
Compressive strength	1706	2560	2844	3911	3555	4977
Tensile strength	171	256	.....	.....	.....	426.6

2. EARLY HIGH STRENGH CEMENTS

	At 3 days (1 day in moist air, 2 days in water)		At 28 days (1 day in moist air, 6 days in water, 21 days in air)	
Mixture 1:3, lb./in.²	1924	1927	1924	1927
Compressive strength	3555	3555	6399	7110
Tensile strength	355	355	497.7	568.8

Tariff on Calcined and Crude Magnesite Raised 50%

PRESIDENT COOLIDGE, in a proclamation issued on November 10, invoked the flexible provisions of the Tariff Act of 1922 to increase the duties on crude magnesite and caustic calcined magnesite by 50%. The increases are necessary, it was stated, to equalize the costs of production of these articles in the United States and the chief competing countries, Greece and British India.

The proclamation, in full text, follows:

Increasing rates of duty on magnesite, crude and caustic calcined.

Whereas in and by section 315 (a) of Title III of the act of Congress approved September 21, 1922, entitled "An Act to provide revenue, to regulate commerce with foreign countries, to encourage the industries of the United States, and for other purposes," it is, among other things, provided that whenever the President, upon investigation of the differences in costs of production of articles wholly or in part the growth or product of the United States and of like or similar articles wholly or in part the growth or product of competing foreign countries, shall find it thereby shown that the duties fixed in this act do not equalize the said differences in costs of production in the United States and the principal competing country, he shall, by such investigation, ascertain said differences and determine and proclaim the changes in classifications or increases or decreases in rates of duty provided in said act shown by said ascertained differences in such costs of production necessary to equalize the same;

Conditions of Production Given Consideration

Whereas in and by section 315 (c) of said act it is further provided that in ascertaining the differences in the cost of production, under the provisions of subdivisions (a) and (b) of said section, the President, in so far as he finds it practicable, shall take into consideration (1) the difference in conditions in production of such or similar articles in the United States and in competing foreign countries; (2) the differences in the wholesale prices of domestic and foreign articles in the principal markets of the United States; (3) advantages granted to a foreign producer by a foreign government, or by a person, partnership, corporation, or association in a foreign country; and (4) any other advantages or disadvantages in competition;

Whereas, under and by virtue of said section of said act, the United States Tariff Commission has made an investigation to assist the President in ascertaining the differences in costs of production of and of all facts and conditions enumerated in said section with respect to the articles described in paragraph 204 of Title I of said tariff act of 1922, namely, crude magnesite and caustic calcined magnesite, being wholly or in part the growth or product of the United States, and of and with respect to like or similar articles wholly or in part the growth or product of competing foreign countries;

Whereas in the course of said investigation hearings were held, of which reasonable public notice was given and at which parties interested were given reasonable opportunity to be present; to produce evidence, and to be heard;

And whereas the President upon said investigation of said differences in costs of production of said articles wholly or in part the growth or product of the United States and of like or similar articles wholly or in part the growth or product of competing foreign countries, has thereby found—

That the principal competing country for crude magnesite is Greece;

That the principal competing country for caustic calcined magnesite is British India:

Duties Do Not Equalize Differences in Costs

And that the duties fixed in said title and act do not equalize the differences in costs of production in the United States and in said principal competing countries, namely, Greece and British India, and has ascertained and determined the increased rates of duty necessary to equalize the same.

Now, therefore, I, Calvin Coolidge, President of the United States of America, do hereby determine and proclaim that the increases in the rates of duty provided in said act shown by said ascertained differences in said costs of production necessary to equalize the same are as follows:

An increase in said duty on crude magnesite (within the limit of total increase provided for in said act) from 5/16 of 1 cent per lb. to 15/32 of 1 cent per lb.;

And an increase in said duty on caustic calcined magnesite (within the limit of total increase provided for in said act) from 5/8 of 1 cent per lb. to 15/16 of 1 cent per lb.

Over $200,000,000 for Highways From Gasoline Tax Per Year

CALIFORNIA led the states in the amount of revenue derived from a tax on gasoline during the first half of 1927, the Bureau of Public Roads of the Department of Agriculture has just announced.

The following table, prepared by the bureau, shows the rate of taxation in cents per gallon in the various states and the revenue derived by each state from a gasoline tax during the first six months of 1927:

	Tax rate on June 30	Rev. for first half 1927
Alabama	4	$ 2,653,637
Arizona	3	518,599
Arkansas	5	1,560,559
California	2	9,035,934
Colorado	3	1,194,077
Connecticut	2	1,307,024
Delaware	3	267,091
Florida	4	5,355,217
Georgia	3½	3,071,528
Idaho	4	606,694
Illinois	0	.....
Indiana	3	4,564,711
Iowa	2	2,777,183
Kansas	2	1,891,245
Kentucky	5	2,472,015
Louisiana	2	1,411,554
Maine	3	742,925
Maryland	4	1,774,442
Massachuetts	0	.....
Michigan	2	5,033,798
Minnesota	2	2,274,327
Mississippi	4	2,136,296
Missouri	2	2,921,065
Montana	3	428,363
Nebraska	2	1,470,084
Nevada	4	199,497
New Hampshire	3	413,581
New Jersey	0	.....
New Mexico	5	614,200
New York	0	.....
North Carolina	4	3,932,544
North Dakota	2	395,933
Ohio	3	7,539,826
Oklahoma	3	3,196,376
Oregon	3	1,613,209
Pennsylvania	2	6,101,696
Rhode Island	2	300,971
South Carolina	5	2,210,636
South Dakota	3	960,630
Tennessee	3	1,983,139
Texas	3	5,975,553
Utah	3½	567,794
Vermont	3	275,536
Virginia	4½	3,122,518
Washington	2	1,631,226
West Virginia	3½	1,416,057
Wisconsin	2	2,526,058
Wyoming	3	256,908
District of Columbia	2	548,605
Total		$101,250,841

Two cent tax rates were effective in Illinois on August 1, 1927, and in New Jersey on July 1, 1927.

Sand and Gravel Convention Committee Meets

A MEETING of the convention committee of the National Sand and Gravel Convention, under the chairmanship of C. H. Ray, was held in Detroit, Mich., November 14. V. P. Ahearn, executive secretary of the association, Washington, D. C., was present and stated that the program was practically completed. It will be of particular interest to operating men. One entire session will be devoted to dredging and river plant operation.

C. H. Ray, chairman of th econvention committee announced plans for entertainment and exhibit features, which will make the Detroit convention one of the most remembered in history. Some very unique plans are under way in connection with entertainment at the annual dinner-dance.

U. S. Gypsum Sells Windsor Cement Co.

SALE of the Windsor Cement Co. at Hartford, Conn., has been announced at the Chicago headquarters of the United States Gypsum Co., which has operated the Windsor Cement Co. since 1921. The purchaser is the City Coal Co. of Hartford. The business will be continued under its own name. R. N. Anderson has been elected president and general manager of the Windsor Cement Co.; R. E. Kelly has been appointed credit and sales manager, and A. C. Jenkins has been appointed office manager and sales agent.

The United States Gypsum Co. acquired the Windsor Cement Co. and several other eastern retail concerns through the purchase, in 1921, of J. B. King & Co. of Staten Island, N. Y. The King manufacturing plant immediately was made an operating unit of the company, but the retail businesses have been operated as independent companies pending their sale. As rapidly as purchasers have been found, the former retail units of J. B. King & Co. have been disposed of, the U. S. Gypsum Co. taking the stand that its business is one of manufacturing and wholesaling, and not retailing.

The purchaser of the Windsor Cement Co., the City Coal Co., also owns a majority of the stock of the Hartford Cement Co. It has been announced that the two firms, the Windsor Cement Co. and the Hartford Cement Co., will be operated as independent and competitive units.

Material Shortage May Result from New England Floods

ACCORDING to Allen E. Beals, of the *Dow Service Bulletin*, a shortage of building material, especially lime, may result from the recent New England floods. He says:

Chief among the building materials originating in New England states for use in building construction in the metropolitan district of New York are brass, granite, lime, spruce forest products, structural and roofing slate and crushed stone.

In none of these communities is there widespread shortage at present, but the effect upon the building material and construction markets is expected to begin to be felt about six weeks to two months from now. By spring there is likely to be some price movements traceable to present troubles in Maine, Vermont, New Hampshire, Massachusetts and Connecticut. Plant repair and postponed demand are going to be heavy.

Some north-eastern quarries have been forced to close for the winter. Lumber stocks have floated away. Warehouse reserves of perishable materials, like lime, have suffered heavy loss, as far as current reports indicate.

Lime and lath are the hardest hit of the basic building materials. E. B. Dodge of the Rockland & Rockport Lime Corp. said some progress is being made in shipping lime by automobile trucks to nearest railroad points where direct transportation could be obtained to New York by rail. W. C. Smith, New York representative of the Woodbury Granite Co., reported his company's Barre, Vermont, plant considerably crippled. He has not been able to get through any message to or from the firm's Bethel plant. He knew of no large buildings that did not have enough granite here to carry them for some time. J. W. Dutton, another granite specialist, said he thought no buildings would be obliged to suffer delay because of failure of granite to arrive. Much Maine granite is sent here by barge.

Lancy Snow, New York sales manager of the Rising & Nelson Slate Co. of West Pawlet, Vermont, said that current supply here was sufficient to take care of all pending structural and roofing slate requirements. He thought the late winter and spring prices would reflect the heavy cost of repairs on machinery and quarry equipment.

Southern Portland Cement, Ltd., New Australian Company

AN important cement undertaking has recently been floated in Australia under the name of Southern Portland Cement, Ltd., with a nominal capital of £1,000,000 ($5,000,000) in 1,000,000 shares of £1 ($5) each. The entire capital has been privately subscribed.

The objects of the undertaking are the immediate erection of works at Berrima, New South Wales, for the manufacture by the wet process of an initial output of 120,000 tons per annum of Portland and quick hardening cements also the development and equipment of a colliery and the establishment of a central electric power station for the requirements of the cement works, the limestone quarry and the colliery.

Two well-known steel manufacturers, Dorman, Long & Co., Ltd., and Hoskins Iron & Steel Co., Ltd., are reported to be largely interested in the venture.

Yourtree-Roberts Sand Co. Buys Lime Plant

THE Yourtree-Roberts Sand Co., of Chester, Ill., recently purchased the plant and quarry of the Muscle Shoals White Lime Co. at Sheffield, Ala., according to a report in the *Chester Herald*. The Alabama plant will be operated as before the sale, manufacturing lime and producing fluxing stone for the iron smelters in the neighborhood.

W. C. Roberts of the Yourtree-Roberts company will take charge of the operations at the newly acquired plant, and Livingston Yourtree will remain at Chester in charge of the sand company.

Alonzo G. Kinyon

ALONZO G. KINYON, an engineer and inventor whose conveying system has really revolutionized certain features of the rock products industry, died November 13th after an operation. He was 57 years old.

Mr. Kinyon was born at Amboy, Ill., and was originally a railroad man specializing in fuels and combustion. He became impressed with the possibilities of efficient combustion which pulverized coal presented and first tried to use it in locomotives. Later he organized a company to introduce pulverized coal heating in hotel and apartment houses. In 1918 he became associated with the Fuller-Lehigh Co., which had made many successful applications of pulverized coal burning in industrial and other installations.

One of the problems connected with the use of pulverized coal was that of "flooding," in the screw and other conveyors that were used to transport it. Flooding came from a condition that caused the pulverized coal to flow like a liquid, passing around the flights of screw conveyors and into places where it would not penetrate in its ordinary condition. In an article in the Annual Review number of ROCK PRODUCTS for 1925, Mr. Kinyon wrote that he studied the flooding of pulverized coal and determined that it came from the mixing of the coal with air, in a certain way and in a certain amount. With only this hypothesis to guide him he began to work on a machine that would pump coal through pipes in its "liquefied" condition and in eight weeks he had it where it would pump the coal through a horizontal line with some lift. In a few months he had his machine where it would pump dusts 200 to 300 ft. with a lift of 25 ft. through a 3-in. line at the rate of four or five tons an hour, and from the data obtained with this machine the present Fuller-Kinyon pump was designed.

Almost as soon as it became known, the pump began to be used for cement, hydrated line, powdered silica, paint pigments and many other powdered substances, and its use has made dustless material handling installations possible and made effective new systems of transportation and storage. The rock products industry and several other industries must acknowledge a great debt to Mr. Kinyn for having solved one of their most troublesome problems.

Mr. Kinyon received full recognition for his work from various societies and scientific bodies. Among the honors conferred upon him was the award of the Longstreth medal of the Franklin Institute and a life membership in the Institute. He was also a member of the Travelling Engineers, the International Railway Association and the American Society of Mechanical Engineers.

His life work made industry safer and more healthful, so the public, as well as the industries he served, owes it a debt of gratitude although it may not know it.

Portland Cement Output in October

Production, Shipments and Stocks Show Seasonal Decline

OCTOBER, 1927, production and shipments of portland cement show the usual seasonal decline from the summer peak but were greater than for any preceding October and 3% higher than a year ago, according to the Bureau of Mines, Department of Commerce.

Portland cement stocks continue to decline and are a little lower than those at the end of October, 1926.

The output of three new plants, located respectively in Florida, Texas and West Virginia, is included in these statistics, which are compiled from reports for October, 1927, received direct from all manufacturing plants except two, for which estimates are necessary on account of lack of returns.

Clinker Stocks

Stocks of clinker, or unground cement, at the mills at the end of October, 1927, amounted to about 5,960,000 bbl. compared with 6,490,000 bbl. (revised) at the beginning of the month.

ESTIMATED CLINKER (UNGROUND CEMENT) AT THE MILLS AT END OF EACH MONTH, 1926 AND 1927, IN BARRELS

Month	1926	1927
January	9,074,000	9,989,000
February	10,931,000	11,943,000
March	12,290,000	12,997,000
April	12,967,000	13,335,000
May	11,695,000	12,514,000
June	10,144,000	10,926,000
July	8,604,000	9,609,000
August	7,362,000	7,887,000
September	6,112,000	*6,490,000
October	5,370,000	5,960,000
November	5,748,000	.....
December	7,799,000	.....

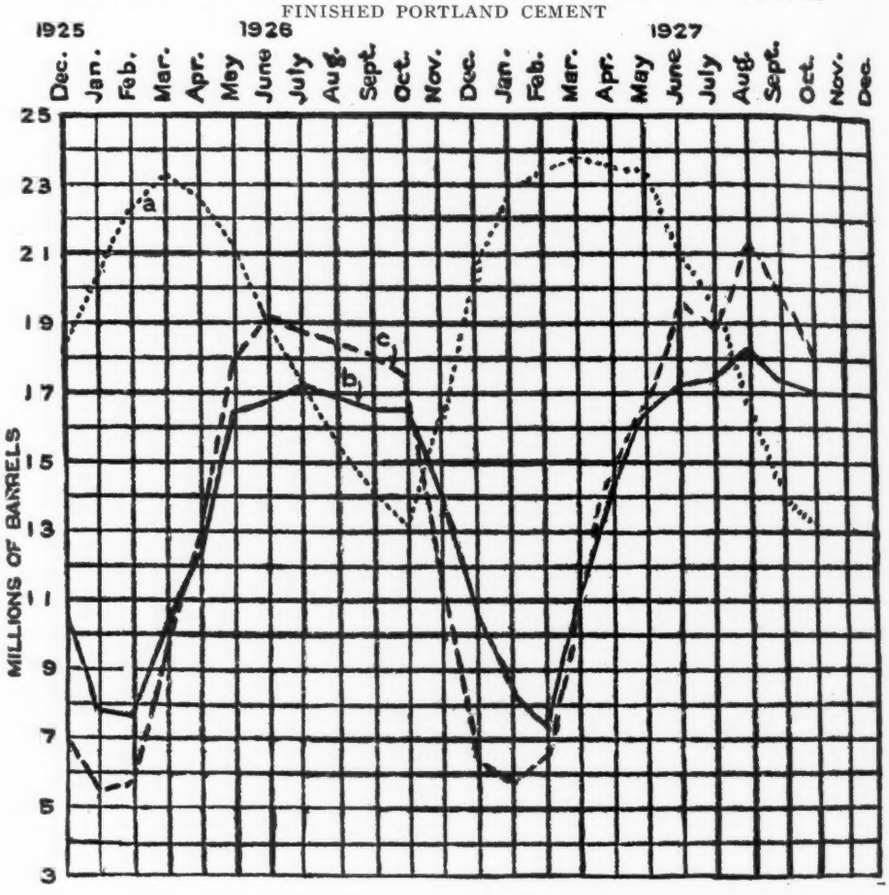
*Revised.

RELATION OF PRODUCTION TO CAPACITY

Period	Oct., 1927 Pct.	Oct., 1926 Pct.	Sept., 1927 Pct.	Aug., 1927 Pct.	July, 1927 Pct.
The month	87.4	93.4	*92.6	94.5	90.3
The calendar year to date	78.3	81.2	77.2	75.2	72.3
The 12 months ended	73.6	76.9	72.3	74.0	73.9

*Revised.

MONTHLY FLUCTUATION IN PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT



(a) Stocks of finished portland cement at factories; (b) Production of finished portland cement; (c) Shipments of finished portland cement from factories

Distribution of Cement

The following figures show shipments from portland cement mills distributed among the states to which cement was shipped during August and September, 1926 and 1927:

PORTLAND CEMENT SHIPPED FROM MILLS INTO STATES, IN AUGUST AND SEPTEMBER, 1926 AND 1927, IN BARRELS*

Shipped to—	1926—Aug.	1927	1926—Sept.	1927
Alabama	173,619	243,841	153,636	229,592
Alaska	1,130	338	668	742
Arizona	45,553	34,598	42,709	38,589
Arkansas	71,312	85,164	75,962	87,996
California	1,165,387	1,158,661	1,204,615	1,114,333
Colorado	133,172	124,628	137,054	107,896
Connecticut	224,946	239,392	255,785	257,188
Delaware	35,287	40,815	46,600	58,667
District of Columbia	75,684	103,217	94,183	100,626
Florida	330,285	180,328	315,214	152,129
Georgia	188,201	193,713	160,377	149,740
Hawaii	8,895	28,219	17,179	11,790
Idaho	44,589	30,000	34,221	29,588
Illinois	1,806,446	2,066,172	1,458,052	1,902,780
Indiana	702,574	868,669	646,062	807,523
Iowa	412,046	602,653	350,251	563,779
Kansas	260,169	251,022	226,069	261,769
Kentucky	175,705	283,184	246,310	245,577
Louisiana	121,260	147,709	108,642	129,457
Maine	108,161	81,018	90,934	63,493
Maryland	208,790	366,046	249,489	285,248
Massachusetts	349,319	314,527	358,853	310,562
Michigan	1,570,296	1,788,820	1,372,831	1,459,078
Minnesota	437,014	480,599	407,570	414,197
Mississippi	80,109	111,007	79,924	92,276
Missouri	611,020	560,364	457,632	489,155
Montana	31,256	50,776	30,597	43,797
Nebraska	201,211	180,063	169,159	195,109
Nevada	9,088	6,149	10,291	4,845
New Hampshire	49,958	56,223	56,092	66,537
New Jersey	691,453	853,588	866,717	960,390
New Mexico	21,231	23,750	17,738	23,103
New York	2,329,217	2,749,722	2,490,511	2,703,962
North Carolina	376,779	340,093	412,719	303,283
North Dakota	43,493	69,872	46,528	35,938
Ohio	1,235,463	1,381,581	1,137,722	1,406,311
Oklahoma	236,223	298,452	219,399	329,676
Oregon	128,525	188,586	150,679	127,909
Pennsylvania	1,493,733	1,706,430	1,620,018	1,683,405
Porto Rico	0	3,500	0	0
Rhode Island	66,573	85,312	56,575	76,597
South Carolina	62,408	103,455	55,967	100,262
South Dakota	44,054	50,994	47,794	56,882
Tennessee	207,528	285,835	239,051	253,945
Texas	484,822	533,591	430,727	449,994
Utah	54,276	60,332	56,948	43,021
Vermont	49,660	67,255	50,697	71,529
Virginia	182,011	211,679	191,720	197,320
Washington	198,993	335,681	202,117	264,748
West Virginia	162,494	239,578	188,894	250,542
Wisconsin	715,784	1,035,131	594,999	711,004
Wyoming	24,901	22,131	23,893	19,223
Unspecified	70,233	23,887	73,748	38,980
	18,512,336	21,348,350	18,032,122	19,782,082
Foreign countries	70,664	62,650	54,878	45,918
Total shipped from cement plants	18,583,000	21,411,000	18,087,000	19,828,000

*Includes estimated distribution of shipments from three plants in August and September, 1927; and from five plants in August and September, 1926.
†Revised.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1926 AND 1927, IN BARRELS

Month	Production 1926	Production 1927	Shipments 1926	Shipments 1927	Stocks at end of month 1926	Stocks at end of month 1927
January	7,887,000	8,258,000	5,674,000	5,968,000	20,582,000	22,914,000
February	7,731,000	7,377,000	5,820,000	6,731,000	22,385,000	23,560,000
March	10,390,000	11,452,000	9,539,000	11,083,000	23,236,000	23,922,000
First quarter	26,008,000	27,087,000	21,033,000	23,782,000	.....	.....
April	12,440,000	14,048,000	12,965,000	14,350,000	22,710,000	23,654,000
May	16,510,000	16,701,000	17,973,000	16,865,000	21,255,000	23,503,000
June	16,866,000	17,224,000	19,134,000	19,761,000	19,000,000	20,972,000
Second quarter	45,816,000	47,973,000	50,072,000	50,976,000	.....	.....
July	17,134,000	17,408,000	18,812,000	18,984,000	17,301,000	19,397,000
August	16,995,000	18,315,000	18,583,000	21,411,000	15,718,000	16,292,000
September	16,571,000	*17,505,000	18,087,000	19,828,000	14,188,000	*13,996,000
Third quarter	50,700,000	*53.228,000	55,482,000	60,223,000	.....	.....
October	16,596,000	17,174,000	17,486,000	18,028,000	13,334,000	13,143,000
November	14,193,000	.....	11,276,000	.....	16,243,000	.....
December	*10,757,000	.....	6,432,000	.....	20,679,000	.....
Fourth quarter	*41,546,000	.....	35,194,000	.....	.....	.....
	*164,070,000	.....	161,781,000	.....	.....	.....

*Revised.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN OCTOBER, 1926 AND 1927, AND STOCKS IN SEPTEMBER, 1927, IN BARRELS

Commercial district	Production 1926—Oct.—1927	Shipments 1926—Oct.—1927	Stocks at end of 1926—Oct.—1927	Stocks at end of September, 1927*
E'n Penn., N. J. & Md.	3,986,000	3,799,000	4,272,000	3,924,000	2,437,000	3,369,000	3,494,000
New York	999,000	1,143,000	921,000	1,171,000	685,000	1,142,000	1,170,000
Ohio, W'n Penn. & W. Va.	1,795,000	1,746,000	1,668,000	1,964,000	2,062,000	1,516,000	1,735,000
Michigan	1,338,000	1,557,000	1,385,000	1,560,000	1,025,000	1,077,000	1,080,000
Wis., Ill., Ind. & Ky.	2,160,000	2,280,000	2,656,000	2,579,000	1,296,000	840,000	1,139,000
Va., Tenn., Ala., Ga., Fla.† & La.‡	1,430,000	1,567,000	1,391,000	1,505,000	1,067,000	1,188,000	1,126,000
E'n Mo., Ia., Minn. & S. Dak.	1,458,000	1,572,000	1,842,000	1,811,000	1,609,000	966,000	1,204,000
W'n Mo., Neb., Kans. & Okla.	1,032,000	1,109,000	984,000	1,208,000	1,455,000	1,215,000	1,314,000
Texas	428,000	532,000	444,000	535,000	406,000	270,000	272,000
Colo., Mont. & Utah	275,000	187,000	252,000	258,000	406,000	313,000	384,000
California	1,381,000	1,388,000	1,359,000	1,191,000	480,000	901,000	704,000
Ore. & Wash.	314,000	294,000	312,000	322,000	406,000	346,000	374,000
	16,596,000	17,174,000	17,486,000	18,028,000	13,334,000	13,143,000	13,996,000

*Revised. †Began producing September, 1927. ‡Began producing June, 1927, and shipping July, 1927.

IMPORTS OF HYDRAULIC CEMENT BY COUNTRIES AND BY DISTRICTS, IN SEPTEMBER, 1927

Imported from	District into which imported	Barrels	Value
Belgium	Florida	27,651	$36,458
	Galveston	3,288	3,955
	Hawaii	19,826	27,064
	Massachusetts	38,733	40,652
	New Orleans	1,042	1,214
	New York	1	5
	Oregon	1,200	1,557
	Philadelphia	35,340	49,311
	Porto Rico	15,098	13,594
	Rhode Island	6,071	7,745
	San Francisco	12,533	18,132
	Washington	1,500	3,215
	Total	162,283	$202,902
Canada	Buffalo	1,500	$2,880
	Maine & N. H.	1,277	2,850
	New York	180	333
	Oregon	3,000	4,002
	Total	5,957	$10,065
Denmark	Philadelphia	11,813	$14,763
	Porto Rico	13,550	22,778
	Total	25,363	$37,541
Norway	Los Angeles	500	$590
	Philadelphia	9,000	10,689
	South Carolina	29,961	35,923
	Total	39,461	$47,202
United Kingdom	New York	2	$6
	Grand total	233,066	$297,716

DOMESTIC HYDRAULIC CEMENT SHIPPED TO ALASKA, HAWAII AND PORTO RICO IN SEPTEMBER, 1927*

	Barrels	Value
Alaska	851	$2,606
Hawaii	21,814	51,245
Porto Rico	8,400	23,576
	31,065	$77,427

*Compiled from the records of the Bureau of Foreign and Domestic Commerce and subject to revision.

Study of the Factors Governing The Strength of Concrete

THE U. S. Bureau of Standards has completed a study of the variables entering into the fabrication of concrete, in which 3,000 cylinders were prepared and tested. Some tentative conclusions from these tests have already been reported in the November, 1926, *Technical News Bulletin* under the title "Water-Cement Ratio in Concrete."

The variables studied are as follows:

1. Quality of cement. Four brands of portland cement with different characteristics were used.

2. Gradation of the coarse aggregate. Eighteen gradings were studied.

3. Ratio of fine to coarse aggregate, four ratios being used.

4. Types of aggregates: Gravel, slag, and crushed limestone.

5. Age. The specimens were tested at six ages, namely, 1, 3, 7, and 28 days, and 3 and 12 months.

6. Proportion of mix. 1:1½:3, 1:2:4, 1:3:6 mixes were used in most part.

The specimens were removed from the molds at 24 hours and then placed in damp storage until test. All concrete was made of such consistency as to develop a flow of 95 as measured by the flow table, using 15 ⅛-in. drops. The following conclusions may be drawn from the results of the tests:

1. At the ages of 1, 3, 7, and 28 days the variations in quality of the cement produced marked differences in the strength of the 1:2:4 concrete. At the 3-month stage, however, the difference in strengths was 9% in terms of the strength of the lowest one, and there was about 6% at the age of 1 year.

2. The ratio of the strength of the concrete made from the four cements at 28 days varied from 1.96 to 2.76 of the strength at 7 days, under the conditions affecting this series of tests.

3. The proper ratio of fine to coarse aggregate for maximum strength depended on the type of the aggregate and its grading.

4. In most cases, when the coarse aggregategate was deficient in one or two of the smaller sizes, that is, those varying between No. 4 to ⅜-in. and ⅜- to ¾-in., a markedly better workability, together with very little change in strength, was obtained when using a mix in which the fine aggregate was 50% of the total aggregate than when the fine aggregate was less than 33⅓% of the total aggregate.—*Technical News Bulletin*, of the U. S. Bureau of Standards.

EXPORTS OF HYDRAULIC CEMENT BY COUNTRIES IN SEPTEMBER, 1927

Exported to—	Barrels	Value
Canada	2,659	$11,709
Central America	11,462	37,305
Cuba	10,126	25,062
Other West Indies and Bermuda	5,869	13,852
Mexico	3,408	10,027
South America	19,498	80,608
Other countries	4,866	29,254
	57,888	$207,817

Dolese and Shepard Pays $8.50 in 1927

DIRECTORS of the Shephard Co. declared an extra dividend of $1.50 and the regular quarterly dividend of $1.50 on the capital stock of the company. The dividends are payable January 1 to stockholders of record December 21. This disbursement brings the total for the year to $8.50, an extra of $1 having been paid on July 1.

EXPORTS AND IMPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1926 AND 1927

Month	Exports 1926 Barrels	Exports 1926 Value	Exports 1927 Barrels	Exports 1927 Value	Imports 1926 Barrels	Imports 1926 Value	Imports 1927 Barrels	Imports 1927 Value
January	72,939	$216,431	75,346	$254,072	360,580	$576,717	193,175	$269,661
February	73,975	220,706	71,404	233,985	314,118	527,948	130,421	200,680
March	69,080	205,647	67,956	240,165	493,241	812,968	181,145	261,519
April	96,296	284,772	72,383	243,832	257,302	398,114	191,868	313,262
May	78,601	224,365	59,332	205,574	223,130	337,031	178,929	263,618
June	80,684	248,814	69,205	237,281	335,570	495,744	129,111	201,682
July	130,822	370,220	72,337	229,737	250,862	395,981	175,035	249,665
August	64,946	216,489	61,371	209,198	350,638	560,532	117,605	170,167
September	70,920	239,174	57,888	207,817	194,129	308,224	233,066	297,716
October	69,389	225,874	.....	.....	263,403	386,335	.....	.....
November	76,598	238,103	.....	.....	55,233	82,949	.....	.....
December	89,976	305,238	.....	.....	151,850	246,293	.....	.....
	974,226	$2,995,833	.....	.....	3,250,056	$5,128,836	.....	.....

Foreign Abstracts and Patent Review

Pulverized Coal Firing. Pulverized coal was introduced in Germany about 1900, following the American practice, as a method of firing rotary kilns. Engineer Karl v. Forel, the Fellner & Ziegler Co., Frankfurt a. M., and the Polysius Co., Dessau, were the outstanding promoters of this method of firing.

Such disadvantages as high fuel consumption, heat losses, formerly blocking the way of the rotary kiln, have been done away with since the advent of waste heat utilization, and pulverized coal is now definitely established in the German cement industry.

The conditions of use of pulverized coal for boilers are somewhat different. The economic depression of post-war years produced frantic efforts to cut down wasteful methods, so pulverized coal was resorted to by many German manufacturers and American installations were copied without regard to the special conditions of native industries. Yet American practice differs essentially from that in Germany. The radiation effect on the refractory lining was reduced by enlarging the firing space to dimensions unknown in Germany, the pulverized coal flame was blown directly on natural corundum, the boiler being heated only by radiation. No very fine grinding was necessary there.

In Germany few new installations are being built at the present time, but quite a few old plants are being adapted to pulverized coal firing. The space is naturally limited, so a coal pulverizer designed with this in view is being marketed under the name of the Mindoga "Resolutor." It consists of a mechanical feeding device, a hammer crusher and an air separator. The shaft is strong enough to withstand shocks and is provided with ball bearings.

The output of the "Resolutor" varies from 100 to 10,000 kg. per hour, with a moisture content of from 10% to 14% when preheated air is used. The fineness of the product is 2% to 10% on the No. 100 sieve or 5% to 25% on the 190 sieve. Power consumption is 12 to 18 hp., all from one motor. —*Tonindustrie-Zeitung* (1927), **51**, 81.

Crystalline Forms in Commercial Portland Cement. The authors (Guttmann and Gille) conducted their crystallographic studies as an attempt to clear the present controversy on the constitution of portland cement. Dyckerhoff's claim, that bicalcium silicate is the main constituent of portland cement clinker, disagrees with observations by Bates, Klein, Phillips and Rankin, who point to tricalcium silicate as the predominant cement mineral.

The optical properties of the crystals were studied on 30 thin sections prepared from clinker, of which 18 represented the commercial product and 12 were obtained in laboratories. Their hydraulic moduli varied from 1.7 to 2.3 and their silica moduli from 1.3 to 2.8.

A polarization microscope, equipped for conoscopic observations, was used. The maximum aperture was 1.2. Observations took place by daylight. A number of powdered samples were also investigated. The indices of refraction were determined with an accuracy of 0.003.

Five main constituents were thus determined. These were designated as I, II, III, IV, and mixed crystals of high color. The crystalline phase designated as I was found to correspond with alite, as characterized by Törnebohm and others. Similarly, phase II was that of belite.

The following properties of these two main constituents of clinker were established:

Alite: Strong double refraction, crystals with two axes forming a small angle with negative character of double refraction. Refraction exponent $n = 1.715$.

Belite: Strong double refraction with positive character of double refraction, varying angle between axes and varying color. Refraction exponent α 1.715 and γ 1.735.

The strongly colored masses, which were found to correspond to celite, consist of several constituents, some of which are isotropic. Their study is to be continued.

Other crystals, met with occasionally, are:

Free lime in the form of crystals.

β^1—bicalcium silicate (?), in large, optically positive crystals of low double refraction, which correspond to the above compound.

Colorless glass, at times in considerable quantities.

Aluminates, isotropic particles, which may be held to be aluminates, were found in one instance.

With reference to the chemical composition of the main constituents, it may be said that, with one exception, free aluminates do not occur in clinkers, and, as color tests have shown their occurrence in alite, the latter may be considered as a formation of mixed crystals of tricalcium silicate with varying amounts of tricalcium aluminate.

Belite corresponds to the β and α bicalcium silicate with varying contents of iron and magnesia.

No data are as yet available of the relation of initial strength to quantities of alite and belite in the clinker.—*Zement* (1927), **39**, 921-24, **40**, 951-953.

Weight per Unit Volume of Portland Cement. The specifications require in a general way that portland cement be characterized by high weight per unit volume, without specifying the method of determining this value. Yet the weight per unit volume varies with the method of filling the container, the size and shape of the latter, and other things.

The author (K. Goslich) designed a simple device based on results from years of experimentation which is of considerable accuracy. The following considerations were made for in the design:

1. The error is reduced when the quantity of cement to be filled is increased, so a two-liter measure is used.

2. The container is relatively flat to permit the air to escape rapidly.

3. The cement is dumped from a bin above by opening double doors forming the bottom of the bin and permitting the cement to be dumped simultaneously over the entire area.

4. To prevent the cement from clinging to the walls of the bin, the cross section of the latter is enlarged toward the bottom.

5. The entire apparatus is enclosed in a box, provided with a door on the side, which may be held in closed position by hand.—*Zement* (1927), **38**, 895-97.

Manufacture of (Fused) Cement. A rotary kiln adopted for the removal of liquid from the hottest zone is closed at one end, and near this end is provided with holes in its shell, which is tapered from the holes toward the closed end.—*English patent No. 276,438.*

Flooring Mortar. The mortar is composed of ordinary magnesia cement, powdered pine bark rich in resin, and a milk product which has been prepared by coagulating with acid. *Japanese Patent No. 2975, Ceramic Abstracts* (1927), 501.

Method of Preparing Lime for Plaster. Quick lime is slaked with a solution of magnesium chloride and aluminium sulphate or that of alum and alkali carbonate. Clay and powdered mica are mixed to the slaked lime. *Japanese Patent No. 3084, Ceramic Abstracts* (1927), 501.

Magnesia Cement. A composition principally of magnesia, slaked lime, and magnesium sulphate or magnesia, magnesium chloride, and litharge or lead hydroxide. *Japanese Patent No. 3211, Ceramic Abstracts* (1927), 501.

Improvement in Cement Rotary Kiln. The rotary kiln shell is water-jacketed and the kiln has several transverse water-tubes. *Japanese Patent No. 3392, Ceramic Abstracts* (1927), 501.

Method of Manufacturing Waterproofing Agent for Cement. Molten mass of resin, fatty acid, and paraffin is saponified

with a solution of caustic potash or potassium carbonate. Aluminium hydroxide is mixed to the product. *Japanese Patent No. 3470, Ceramic Abstracts* (1927), 501.

Process of Manufacturing Magnesia Cement. Magnesia cement is prepared by adding a solution of magnesium nitrate to magnesia or a substance containing it or by grinding the product obtained, calcining a mass which has been obtained by kneading magnesia, or a substance containing it, with nitric acid. *Japanese Patent No.* 4025, *Ceramic Abstracts* (1927), 501.

Waterproofing Agent for Cement Mortar. Mixture of magnesium carbonate, asbestos, and powdered soap is heated under constant stirring, care being taken that the soap shall not be decomposed. *Japanese Patent No.* 4122, *Ceramic Abstracts* (1927), 501.

Waterproofing Agent for Cement. The waterproofing agent is composed of lime, calcium chloride, barium chloride, ammonium carbonate, aluminium acetate, gelatin, albumen, and water. Dextrin or similar substances may be used for albumen. The slip also accelerates the hardening of cement. *Japanese Patent No.* 5092, *Ceramic Abstracts* (1927), 501.

Waterproofing Agent for Cement. The agent is prepared from fatty acid, albumen, soluble silicofluoride, and ammonia water. *Japanese Patent No.* 5903, *Ceramic Abstracts* (1927), 501.

Process of Manufacturing a Waterproofing Agent for Cement. An excess of quick lime is added to a solution of washing soap and sodium silicate. The product is dried by the heat of combination and is obtained as fine powder. *Japanese Patent No. 6037, Ceramic Abstracts* (1927), 501.

Process of Manufacturing a Building Material. Fumio Matsunaga. Japan 6,666 Oct. 16, 1925. Ammonium borate and a mixture of plaster of Paris and quick-lime obtained by pouring sulphuric acid on quicklime are mixed with coal-cinder or grog. The plastic mass is pressed into any desired form and is left to harden. *Ceramic Abstracts* (1927), 501.

Process of Preparing a Waterproofing Agent for Cement. The Kokueki Bosui Kogyo Co. Japan 6,734, Oct. 25, 1925. The agent is made of soap, alum, Hydrosme Rivieri, and glue. *Ceramic Abstracts* (1927), 501.

Waterproof Magnesia Cement. Seisho Horio. Japan 7,183, Dec. 9, 1925. Boric acid or soluble borate and resin or resinic acid are compounded to a mixture of magnesia and magnesium chloride. *Ceramic Abstracts* (1927), 502.

Study of the Three-Component System of Lime-Silica-Alumina. The article is written by Janecke in reply to a publication of the results obtained at the United States Bureau of Standards by Dyckerhoff, Hansen, Ashton and Bogue (*Zement,* No. 16, 1927 and Rock Products, April 16, 1927).

Previous to that Dyckerhoff had checked the existence of the compound $8CaO{\cdot}2SiO_2{\cdot}Al_2O_3$ first isolated by the author in 1911 and characterized by monoclinic crystals, optically negative, and having a refraction angle $\alpha = 1.703$, $\gamma = 1.707$ and double refraction $\gamma - \alpha = 0.004$. The plane of the optical axis is normal to the longitudinal dimension of the crystals; the specific gravity is 3.090.

Dyckerhoff now maintains that tricalcium silicate is the prevalent form of crystals mistaken for $8CaO{\cdot}SiO_2{\cdot}Al_2O_3$. The latter compound was found to make up 90% of the fused cement mix, while $3CaO{\cdot}SiO_2$ could at best make up but 31.3% of the mass.

Somewhat puzzling is the fact that no reference is made to the author's recent publications. The decomposition of the compound established by the author at low temperature would be easily explained by the conditions of incomplete or metastable equilibrium, carefully outlined in *Zement,* p. 610 and 643, 1926. It seems unnecessary to assume that the compound $8CaO{\cdot}2SiO_2{\cdot}Al_2O_3$ is unstable at low temperature. The long needle-shaped crystals, found in a melt containing iron by the four authors, show great optical resemblance of $3CaO{\cdot}SiO_2$ to the compound $8CaO{\cdot}2SiO_2{\cdot}Al_2O_3$.

An x-ray study was also carried out under the supervision of the author and resulted in the determination of free lime. It must be assumed that the authors did not deal with the regular $8CaO{\cdot}2SiO_2{\cdot}Al_2O_3$ needles, but with their products of decomposition. Otherwise the x-ray evidence would contradict that obtained by means of the microscope.

The only possible correction to my latest publications (*Electrochemie and Zement,* 1926) would be that the 8:2:1 compound has a lower stage of existence. This, however, is doubtful as the compound fuses at a very high temperature (1850 deg. C.), and would then exist only in a certain range, becoming unstable at lower temperatures. *Tonindustrie-Zeitung* (1927) **80,** 1456-57.

Recent Process Patents

The following brief abstracts are of current process patents issued by the U. S. Patent Office, Washington, D. C. Complete copies may be obtained by sending 10c to the Superintendent of Documents, Government Printing Office, Washington, for each patent desired.

Rotary Sand and Gravel Washer. In sand and gravel washers, the combination with a rotatable drum, having an inlet opening at one end and an outlet opening at the other end; means for introducing into the drum, through the inlet opening the sand and gravel to be washed and separated; means for continuously supplying water to the drum during operation of the apparatus, to maintan a predetermined quantity of water in the drum. A number of buckets in the drum are arranged in successive series, each being open adjacent the shell of the drum and having a baffle member so arranged and constructed as to, during rotation of the drum, prevent passage of sand and gravel through the bucket while allowing free passage of water. The end of the bucket remote from the drum shell is formed into an inclined spout, the construction being such that as rotation of the drum carries the bucket through lowermost position in the drum toward uppermost position, the sand and gravel in advance of the baffle is moved positively through the water in the drum and carried upwardly within the bucket, and, when the bucket reaches elevated position, is dropped from the baffle into the inclined spout, from which it slides and is advanced into the zone of the next succeeding series of buckets.—*U. S. Patent No.* 1,645,603.

Unburned Refactory Brick. A mixture of 90 to 95% dead burned powdered magnesite with from 10 to 5% of dry powdered sodium silicate to which is added sufficient water to secure plasticity, is molded or pressed into desired shape and put through a special drying process. This process consists of placing the moist brick on rack cars and moving them through a tunnel dryer in which the humidity is maintained at 75% upward and the temperature at 130 deg. F. for about 10 hours in the first stage of drying, 60% upwards of humidity and 180 to 200 deg. F. for 30 hours in the second stage and as low a humidity as possible with a temperature of 200 deg. F. for 48 hours in the third or final drying stage. *U. S. Patent No.* 1,643,181.

Improvement to Gas-Fired Shaft Kilns. The primary air for the burners is formed by a portion of the combustion air which is introduced at the base of the recuperating chamber. Partitions forming lateral compartments in the recuperating chamber are used to separate the primary air from the secondary air which is passed directly to the calcining zone. *British Patent No.* 236,776.

Wall Board Manufacture. The edges of the covering paper are trimmed before the plaster mass is deposited between them. Reinforced edges are made by inserting the trimmings from the paper in the sides of the board as it is being formed. *C. R. Birdsey, U. S. Patent No.* 1,643,801.

Hardening and Toughening Aggregate. A batch of aggregate (500 lb.) is placed in an agitator and a small quantity of granulated quicklime (10 lb.) added and the whole mixed for about 30 seconds. The broken stone should be clean and free from soil or stone dust. *U. S. Patent No.* 1,645,891.

Roller Separating or Classifying Machine. A combination of roller sets arranged in a supporting frame with means for varying the spacial relation between the roller members in both a lateral and vertical direction to permit sizing of materials. *U. S. Patent No.* 1,647,816.

Roller Separator or Classifier. An adjustable set of driven rollers arranged in a supporting frame over which the material to be sized passes. The device is equipped with means for preventing clogging between rollers. *U. S. Patent No.* 1,647,815.

Traffic and Transportation

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Car Loadings of Sand and Gravel, Stone and Limestone Flux

THE following are the weekly car loadings of sand and gravel, crushed stone and limestone flux (by railroad districts), as reported by the Car Service Division, American Railway Association, Washington, D. C.:

CAR LOADINGS OF SAND, GRAVEL, STONE AND LIMESTONE FLUX

	Limestone Flux Week ended		Sand, Stone and Gravel Week ended	
District	Oct. 22	Oct. 29	Oct. 22	Oct. 29
Eastern	2,886	3,123	14,623	16,263
Allegheny	3,180	3,842	9,711	11,161
Pocahontas	452	396	1,211	1,293
Southern	675	714	12,531	13,961
Northwestern	1,088	1,487	9,712	9,444
Central Western	556	368	13,292	13,181
Southwestern	457	370	7,441	7,247
Total	9,294	10,300	68,521	72,550

COMPARATIVE TOTAL LOADINGS, BY DISTRICTS, 1926 AND 1927

	Limestone Flux 1926 Period to Date	1927	Sand, Gravel and Stone 1926 Period to Date	1927
District	Oct. 30	Oct. 29	Oct. 30	Oct. 29
Eastern	147,471	147,606	459,587	466,700
Allegheny	169,371	156,390	338,619	343,749
Pocahontas	22,770	22,192	39,223	40,777
Southern	28,514	25,678	534,661	528,444
Northwestern	63,654	58,707	287,001	289,876
Central Western	21,942	22,053	400,401	410,925
Southwestern	12,779	15,298	226,980	240,841
Total	466,501	447,924	2,286,472	2,321,382

COMPARATIVE TOTAL LOADINGS 1926 AND 1927

	1926	1927
Limestone flux	*466,501*	*447,924*
Sand, stone, gravel	*2,286,472*	*2,321,382*

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning November 19:

NEW ENGLAND FREIGHT ASSOCIATION DOCKET

13363. **Sand, blasting, core, fire and sea,** carloads (See Note 2), from New Haven, Conn., to Providence, R. I., 9½c. Reason—To provide same basis of rates as in effect to other consuming points.

13367. **Limestone,** carloads (See Note 2), from West Stockbridge, Mass., to Newark, N. J., 16c, via Greenville Piers, N. J., P. R. R. Reason—To meet rate via competing route.

13368. **Limestone, ground,** carloads, minimum weight 50,000 lb., from West Stockbridge, Mass., to Oak Grove, Mass., 18½c, via Worcester, Mass. Reason—To provide rate on same basis as now in effect to other B. & M. R. R. points.

13369. **Lime,** carloads, minimum weight 50,000 lb., from Lee, Mass., to Montreal, Que., 25c. Reason—Same as effective to Ottawa, Ont., to which Montreal is intermediate.

13400. **Limestone, ground,** in bulk or in bags, carloads, minimum weight 50,000 lb., from Canaan and Falls Village, Conn., to Oakfield, N. Y., 19½c, via N. Y. N. H. & H., State Line, B. & A., Albany, W. S. R. R. Reason—To provide same rate as is now in effect on agricultural limestone.

13407. **Sand and gravel,** carloads (See Note 2) from Scotia, N. Y., to Berlin, North Petersburgh, Petersburg, N. Y., 125c; to Center Berlin, Cherryplain, North Stephentown, Stephentown, N. Y., 130c; to Adams Crossing, Center Lebanon, Lebanon Springs, New Lebanon, N. Y., 135c; to Brainard, N. Y., 140c per ton of 2000 lb., via B. & M. R. R., Petersburg Jct., Rutland R. R. Reason—To place shipments at Scotia, N. Y., on a comparable basis with shippers located at Feura Bush, N. Y.

13411. **Crushed stone,** carloads, minimum weight 80,000 lb., from Greenfield, Mass., to Shelburne Falls, Mass., 55c. Reason—To meet motor truck competition.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

CENTRAL FREIGHT ASSOCIATION DOCKET

16943. To establish on **crushed stone,** in bulk, in open top cars, carloads, Gibsonburg, Maple Grove and Woodville, Ohio, to Zanesville, Ohio, rate of $1.25 per net ton. Present rate: From Gibsonburg and Maple Grove, Ohio, $1.40, and from Woodville, Ohio, $1.50 per net ton.

16945. To establish on **crushed stone,** carloads, Holland, Ohio, to Elkhart, Ind., rate of $1.01 per net ton, and to Mishawaka and South Bend, Ind., rate of $1.13 per net ton. Present rate: To Elkhart, Ind., rate of $1.13 per net ton, and to Mishawaka and South Bend, Ind., rate of $1.30 per net ton.

16946. To establish on **stone, crushed,** carloads, Chicago, Joliet and Lehigh, Ill., Monon, Ind., and points grouped therewith, to Mishawaka, Ind., rate of $1.01 per net ton. Present rate, 90c per net ton.

16948. To establish on **sand and gravel,** carloads, Wapakoneta, Ohio, to Sidney, Ohio, rate of 60c per net ton.

16968. To establish on **crushed stone,** carloads, Carey, Ohio, to Loveland, Ohio, rate of $1.25 per net ton. Present rate, 6th class.

16970. To establish on **sand and gravel,** carloads, Kern, Ind., to Urbana and Champaign, Ill., rate of 80c per net ton. Present rate, 6th class.

16792. To establish on **limestone, ground,** carloads, minimum weight 50,000 lb., Danbury, Fremont, Genoa, Marblehead, Martin, Rocky Ridge and Sandusky, Ohio, to Pennsylvania and West Virginia, rates as shown below:

(Rates in cents per net ton)

From Danbury, Ohio; Marblehead, Ohio,

To—	Proposed	Present
Clarksburg, W. Va.	265	328
Fairmont, W. Va.	265	328
Glenshaw, Penn.	202	265
Kanawha, W. Va.	227	328
Morgantown, W. Va.	265	360
Uniontown, Penn.	265	360

From Fremont, Genoa, Martin, Rocky Ridge and Sandusky, Ohio,

To—	Proposed	Present
Clarksburg, W. Va.	265	360
Fairmont, W. Va.	265	360
Glenshaw, Penn.	202	320
Kanawha, W. Va.	227	360
Morgantown, W. Va.	265	360
Uniontown, Penn.	265	360

17016. To establish on **sand and gravel,** carloads, Lafayette, Ind., to Elkhart and Goshen, Ind., rate of $1.15 per 2000 lb., and to Benton Harbor, Mich., $1.22 per 2000 lb. Present rates, 6th class.

17019. To establish on **limestone, ground or pulverized,** carloads, minimum weight 25 net ton, Piqua, O., to McLeansboro, Ill., rate of $2.90 per net ton. Present rate, 6th class rate of $4.80 per net ton.

17022. To establish on **sand (lake, river and bank,** other than sand-loam), carloads, Miller, Ind., to Wheaton, Elgin, Elmhurst and Westchester, Ill., following rates per net ton:

To—	Pres.	Prop.
Wheaton, Illl	$1.17	$0.93
Elgin, Ill.	1.26	1.25
Elmhurst, Ill.	1.17	.93
Westchester, Ill.	1.17	.93

SOUTHERN FREIGHT ASSOCIATION DOCKET

36966. **Granite or stone, crushed,** or rubble, from Williston, Ocala and Santos, Fla., to Dawson, Ga. It is proposed to establish the following commodity rates on granite or stone, crushed or rubble, carloads (See Note 3), to Dawson, Ga.: From Williston, Fla., 176c; Ocala, Fla., 180c; Santos, Fla., 189c per net ton—made on basis generally observed in establishing rates on this commodity from interior Florida points to destinations in the state of Georgia.

36976. **Sand and gravel,** from Nashville to Lewisburg, Tenn. Present rate, 70c. Proposed intrastate rate on sand and gravel, carloads (See Note 3), from Nashville, Tenn., to Lewisburg, Tenn., for application via N. C. & St. L. Ry., 80c per net ton, made not less than the rate applicable via the L. & N. R. R., the rate-making line.

37014. **Sand and gravel,** etc., from Frankfort, Ky., to Walton, Ky., and intermediate C. N. O. & T. P. Ry. stations. It is proposed to establish reduced rate of 100c per net ton on **sand, gravel, crushed stone,** slag, rubble stone, **broken stone** and chert, in straight or mixed carloads (See Note 3), from Frankfort, Ky., to Walton, Ky., via the F. & G. Ry., to Georgetown, Ky., C. N. O. & T. P. Ry., Georgetown to destination, same as rate in effect via the L. & N. R. R. It is also proposed to observe the suggested rate as maxima at intermediate points.

37046. **Crushed stone,** from Belcross, N. C., to Elizabeth City, N. C. It is proposed to establish interstate rate of 55c per net ton on crushed stone, carloads, from Belcross, N. C., to Elizabeth City, N. C.

37060. **Sand (molding),** from Lipe, Sawyers Mill and Hollow Rock, Tenn., to St. Louis, Mo., group. Present rate, 410c per net ton. (Class M.) Proposed rate on sand (molding), carloads, minimum weight 30,000 lb., from the origins mentioned to St. Louis, Mo., East St. Louis and Belleville, Ill., 232c per net ton, which rate compares favorably with rate from Centreton and Lake Ciecott, Ind., to St. Louis, Mo.

37067. **Crushed stone** from Mile Post 285, Fla., to S. A. L. Ry. common points south of West Palm Beach, Fla. It is proposed to establish rates on crushed stone, carloads, minimum weight 30,000 lb., from Mile Post 285, Fla., to common points on the S. A. L. Ry. south of West Palm Beach, Fla., made the same as rates applicable from Kendal, Fla., on the F. E. C. Ry.

37079. **Molding sand** from Evansville, Ind., to Paducah, Lexington, Ky., and Mississippi Valley points. In lieu of class rates now applicable it is proposed to establish the following commodity rates on sand, molding (See Note 3), from Evansville, Ind.: To Paducah, Ky., 160c; Jackson, Tenn., 195c; Corinth, Miss., 275c; Laurel, Miss., Hattiesburg, Miss., Meridian, Miss., 293; Gulfport, Miss., Mobile, Ala., and New Orleans, La., 330c per net ton.

37080. **Sand and gravel** from Cairo, Ill., and Metropolis, Ill., to I. C. R. R. stations in Tennessee and Kentucky. It is proposed to establish rates on sand and gravel, carloads, to I. C. R. R. stations in Kentucky and Tennessee as follows: From Cairo, Ill., 20c per ton higher than from Paducah, Ky., and from Metropolis, Ill., 30c per ton higher than from Paducah, Ky., in lieu of present mileage or combination rates. Statement of present and proposed rates will be furnished upon request.

36176, Amdt. 1. **Sand, gravel** and slag from Golden, Miss., and Corinth, Miss., to I. C. R. R. stations in Alabama. Submittal 36176, included in

Docket No. 385, for October 3, 1927, hearing, proposes the establishment of rates on the traffic referred to above, no lower than the rates prescribed by the Alabama Public Service Commission applicable on Alabama state traffic. This proposition is now amended to make the following specific changes in the proposed rates: Change proposed rate on gravel from Golden, Miss., to Jasper and Cordova, Ala., to 100c per net ton instead of 110c; change the suggested rate on sand from Golden, Miss., to Haleyville, Ala., to 80c instead of 79c per net ton; provide for rate of 100c per net ton on sand from Golden, Miss., to Jasper and Cordova, Ala., 110c per net ton to Birmingham, Ala.

WESTERN TRUNK LINE DOCKET

5129A. **Sand,** carloads (See Note 3). In no case shall the minimum weight be less than 40,000 lb., from Greenville, Ill., to St. Charles, Mo. Present rate, $1.40 per ton of 2000 lb.; proposed, $1.48 per ton of 2000 lb.

TRUNK LINE ASSOCIATION DOCKET

15773, Sup. 1. **Agricultural lime,** carloads, minimum weight 30,000 lb., also **ground limestone,** carloads, minimum weight 50,000 lb., from Bellefonte, Pleasant Gap and Stover, Penn., to Savage, Md., 11c per 100 lb.

16822. **Molding sand,** carloads (See Note 2), from Allegany and Vandalia, N. Y., to Utica, N. Y., $2 per ton of 2000 lb. Reason—Proposed rate is comparable with rate now in force from Vandalia to Syracuse, N. Y., from Hutchins, Penn., to Auburn, East Rochester and Watertown, N. Y., and from Buffalo, N. Y., to Wittmer, Penn., as per Erie R. R. Tariff I. C. C. 17953 and P. R. R. G. O. I. C. C. 13801

16828. **Crushed stone,** carloads, (See Note 2), from Allentown, Penn., to Reading Co. stations, Philadelphia, Birdsboro, Emaus, Tamaqua, Mt. Carmel, Sunbury, Rupert, Kneedler, Newtown, Penn., and various, rates ranging from 90c to $1.70 per ton of 2000 lb. Reason—Proposed rates compare favorably with rates in force from Bethlehem, Penn.

16868. **Lime, building, agricultural,** chemical and land, carloads, minimum weight 30,000 lb., from stations in the Frederick-Martinburg-Strasburg groups, as per B. & O. R. R. I. C. C. 19287, to Sodus, N. Y., 19c per 100 pounds. Reason—Proposed rate is the same as now applicable from the Frederick-Martinburg-Strasburg district to Lyndonville, N. Y.

16871. **Crude fluxing limestone,** carloads (See Note 2), from Pleasant Gap and Bellefonte, Penn., to Swedeland and Ivy Rock, Penn., $2.02 per ton of 2240 lb., applicable only when shipped in open top equipment or when shipped in closed equipment during period of car shortage when open top equipment is not available and closed equipment is furnished at carrier's option. When shipped in box cars at times other than during period of open top equipment shortage, ground limestone rates will apply. Reason—To establish same rates as are now at present in force to Philadelphia, Penn., as per P. R. R. G. O. I. C. C. No. 14567.

16878. **Ground limestone,** carloads, minimum weight 50,000 lb., from Bellefonte and Pleasant Gap, Penn., to Valencia, Penn., 12c per 100 lb. Reason—Proposed rates are comparable with rate now in force from Martinsburg, W. Va., as per B. & O. I. C. C. 19287.

16882. **Crushed stone and sand,** carloads, from Bethlehem, Penn. (C. N. J.) to D. L. & W. R. R. stations, Dover, Andover, Water Gap, Mountain Home, Pocono Summit, Moscow, Pittston, Plymouth, Rupert and various, rates ranging from 95c to $1.80 per ton of 2000 lb. Reason—Proposed rates are based on the Birdsboro crushed stone scale plus 20c per net ton.

16889. **Crushed stone,** carloads (See Note 2), from Bellefonte and Pleasant Gap, Penn., to end of Bens Creek Branch, end of Solomon Branch, end of Martin Branch and Leahy Bros. Colliery No. 1, Penn., $1.05 per ton of 2000 lb. Reason—To establish rates which will be comparable with those in force on like commodities between points in the same general territory as per P. R. R. G. O.-I. C. C. No. 14487.

16890. **Crushed stone,** carloads (See Note 2), from Bound Brook, N. J., to Flemington, N. J., 70c per ton of 2000 lb. Reason—Proposed rate compares favorably with rates on like commodities from Bound Brook, N. J., to West Side Ave., Jersey City, N. J., to Chrome, N. J., as per C. N. J. I. C. C. G-3295.

16908. **Lime,** chemical, blast or glass, **agricultural, land or fluxing,** carloads, minimum weight 30,000 lb., and **ground limestone,** carloads, minimum weight, 50,000 lb., from Spahr's, Md., to Reading Co. stations from Carlisle, Penn., to Guernsey, Penn., inclusive, 11c per 100 lb. Reason—Proposed rates compare favorably with rates now published from Martinsburg, W. Va., to Lees Cross Roads to Lemoyne, Penn., inclusive, as per W. Md. I. C. C. 21047.

16916. **Stone, natural** (other than bituminous asphalt rock), **crushed,** N. O. I. B. N., in O. C., carloads (See Note 2), from Rochester, N. Y., to N. Y. C. R. R. and W. S. R. R. stations, Syracuse, Fox Ridge, West Batavia, Buffalo, Suspension Bridge, Martisco, Auburn, Wilson, Metcalf, Thompson's, Earl, Penn Yan, Corning, N. Y., Tompkins Mills, Cedar Run, Penn., Weedsport, Newark, Oakfield, Bowmansville, N. Y., and various, rates ranging from 75c to $1.95 per ton of 2000 lb. Reason—Proposed rates compare favorably with rates now in effect from Coldwater, N. Y., as per N. Y. C. R. R. I. C. C. N. Y. C. No. 15402.

Cement Rate Hearing at Chicago

HEARING in I. and S. No. 2988, cement, carloads, from Linwood, Ia., to points in Illinois, was held at Chicago before Examiner Hagerty November 15. The object of the suspended tariff is the establishment of a rate of 10.5 cents a 100 lb. on cement from Linwood to Chicago, in lieu of the present rate of 12 cents. A minimum weight of 80,000 lb. is proposed in connection with the 10.5 cent rate as against the present minimum of 50,000 lb. The tariff was suspended on the protest of C. F. A. carriers.

E. Rigg, assistant general freight agent of the Rock Island, said the suspended rate was proposed at the request of the Dewey Portland Cement Co., which had recently established a plant at Linwood, a station 7.5 miles out of Davenport, Ia., and within the Davenport switching district. He said the plant had a capacity annual production of a million barrels and that shipments from the plant had begun July 1. While the suspended rate of 10.5 cents applied to intermediate points in the schedule filed, he said it was the intention of the Rock Island and the Milwaukee, the two roads serving the Linwood plant and publishing the rate, to ask for fourth section relief permitting them to charge existing rates to all points but Chicago, in the event the Commission approved the 10.5 cent rate to Chicago. He said that, if the suspended schedule was allowed to go into effect, the 12 cent rate, with a minimum of 50,000 lb., would continue in effect, applying alternatively with the lower rate and higher minimum. He explained that the existent 12 cent rate was based on the short-line mileage (not more than three lines) of 171.4 miles as set out in the scale prescribed in docket 12710, but that the lower rate compared favorably with so-called key rates fixed by the Commission in the cement cases of 1923. He pointed to numerous rates in the territory involved that, he said, were lower than the scale prescribed by the Commission, calling particular attention to a rate of 8 cents from the La Salle (Ill.) group to Chicago, which, he said, was 1.5 cents below the scale, as was the proposed rate from Linwood to Chicago.

Raymond Moore, vice-president and secretary of the Dewey Portland Cement Co., described the competition to which the Linwood plant was subjected and said his company's plant was entitled to as low an adjustment as its competitors, in view of the extreme competition. He said his company had shipped 65 cars of cement to Chicago this year, with an average weight of 105,895 lb., giving earnings of $127.07 at the 12 cent rate, and of $111.19 at the 10.5 cent rate. He pointed to numerous instances of rates lower than the scale prescribed in docket 12710 in effect in C. F. A. territory over the rails of protestant carriers.

Irving L. Artes, in charge of the commerce department of the Central Freight Association, said the 10.5 cent rate was apparently proposed without regard to the existing adjustment from other producing points to markets and the result of allowing its establishment would be widespread dissatisfaction. He said that, if the rate was allowed, the C. F. A. lines would have to establish rates from points in their territory to Chicago on a competing basis and the result would be the complete disruption of the existing rate fabric. That conclusion, he said, was not theory, but a certain deduction based on long experience. To allow the suspended rate to go into effect, he said, would be to go back to the unsatisfactory situation that existed prior to the disposition of docket 12710. He said the increased minimum proposed with the lower rate was not a justification for the reduction, as the average loading in the territory was 80,000 lb.—*Traffic World.*

Cement to Mississippi Valley

A READJUSTMENT of rates on portland cement, from producing points east and west of the Mississippi which shall disregard the Mississippi river as a rate-controlling factor even to the extent of not allowing anything for the crossing of that stream, has been proposed by Examiner John T. Money in No. 16845, Iola Cements Mills Traffic Association et al. vs. Alabama and Vicksburg et al, seven sub-numbers thereunder, No. 16998, Oklahoma Portland Cement Co. vs. Same, and Leland's Fourth section applications Nos. 462, 638 and 12050.

Money proposes that the commission establish rates, in place of those found unreasonable and unduly prejudicial, from points in the Kansas gas belt, Ada, Okla., Harry's and Houston (Manchester), Texas, Hannibal (Ilasco), Mo., Birmingham and North Birmingham, Spocari and Ragland, Ala., Portland, Ga., Chattanooga, Nashville and Richard City, Tenn., Marquette, Mo., and Cosmosdale, Ky., to destinations in Louisiana, Arkansas, Mississippi and Tennessee on the basis of the scale prescribed in Iola Cement Mills Traffic Association vs. A. W., 87 I. C. C. 45, called by him the Oklahoma case, and intrastate in Louisiana.

Carriers and complainants suggested rates and bases of rates which Money discussed at length in the light of other cases in the course of his traveling to the conclusion that the scale in the Oklahoma case should be used in making rates, both east and west of the Mississippi river, based on actual distance, calculated in accordance with formula set forth by him.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F.O.B., at producing point or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Chaumont, N. Y.	.50	1.75	1.75	1.50	1.50	1.50
Chazy, N. Y.	.75	.....	1.60	1.30	1.30	1.30
Coldwater, N. Y.—Dolomite			1.50 all sizes			
Danbury, Conn.	2.25	2.25	2.00	1.75	1.50	.....
Dundas, Ont.	.30	1.05	1.05	.90	.90	.90
Frederick, Md.	.50@1.00	1.35@1.50	1.15@1.50	1.10@1.15	1.05@1.10	1.05@1.10
Munns, N. Y.	1.00	1.50	1.50	1.40	1.25	.....
Northern New Jersey	1.60	1.50@1.80	1.30@2.00	1.40@1.60	1.40@1.60	.....
Prospect, N. Y.	1.00	1.40	1.25	1.25	1.25	.....
Rochester, N. Y.	1.50	1.50	1.50	1.50	1.50	1.50
Walford, Penn.	.....	.....	1.35h	1.35h	1.35h	1.35h
Watertown, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL:						
Afton, Mich.	50	.50	.50	.50	.50	1.50
Alton, Ill.	1.85	.....	1.85	.....	.....	.....
Buffalo and Linwood, Iowa	1.10	.....	1.45	1.25	1.30	1.30
Chasco, Ill.	1.00@1.30	.....	1.00@1.15	.....	1.00@1.15	.....
Columbia and Krause, Ill.	.90@1.20	.90@1.20	1.00@1.20	1.00@1.20	1.00@1.20	1.25
Dubuque, Iowa	1.00	1.25	.....	1.25	1.25	.....
Greencastle, Ind.	1.25	1.25	1.15	1.05	.95	.95
Lannon, Wis.	.80	1.00	1.00	.90	.90	.90
McCook, Ill.	1.00	1.25	1.25	1.25	1.25	1.25
River Rouge, Mich.	1.20	1.20	1.20	1.20	1.20	1.20
Milltown, Ind.	.....	.90@1.00	1.00@1.10	.90@1.00	.85@ .90	.85@ .90
Mt. Vernon, Ill.	1.10@1.20	1.00	1.00	1.00	1.00	.....
Sheboygan, Wis.	1.10	1.10	1.10	1.10	1.10	.....
Stone City, Iowa	.75	.....	1.30	1.20	1.00	.....
St. Vincent de Paul, Que.	.70	1.35	1.00	.85	.80	1.25
Toledo, Ohio	1.60	1.70	1.70	1.60	1.60	1.60
Toronto, Ont.	1.55	2.05	2.05	1.90	1.90	1.90
Valmeyer, Ill. (fluxing limestone)	.90@1.20	.....	.....	1.75	.....	1.75
Waukesha, Wis.	.90	.....	.....	.90	.90	.90
Wisconsin Points	.50	.....	1.00	.90	.90	.....
Youngstown, Ohio	.70j	1.25l@1.35h	1.25l@1.35h	1.25l@1.35h	1.25l@1.35h	1.25l@1.35h
SOUTHERN:						
Alderson, W. Va.	.50	1.40	1.35	1.25	1.20	1.15
Atlas, Ky.	.50	1.00	1.00	1.00	1.00	1.00
Brooksville, Fla.	.75	.....	2.65	2.65	2.40	2.00
Cartersville, Ga.	1.50	1.65	1.65	1.35	1.15	1.15
Chico and Bridgeport, Tex.	1.00	1.30	1.25	1.20	1.05	1.00
El Paso, Tex.	1.00	1.00	1.00	1.00	.....	.....
Graystone, Ala.			Crusher run, screened, $1 per ton			
Kendrick and Santos, Fla.			3½ in. and less, $1 per ton			
Ladds, Ga.	.....	1.65	1.65	1.35	1.15	1.15
New Braunfels, Tex.	.60	1.25	1.10	.90	.90	.90
Rocky Point, Va.	.50@ .75	1.40@1.60	1.30@1.40	1.15@1.25	1.10@1.20	1.00@1.05
WESTERN:						
Atchison, Kan.	.50	1.90	1.90	1.90	1.90	1.80
Blue Springs & Wymore, Neb.	.25	1.45	1.45	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25	1.25	1.25	1.25	1.00	.....
Rock Hill, St. Louis Co., Mo.	1.15	1.15	1.15	1.15	1.15	1.15
Sugar Creek, Mo.	1.15*	1.60†	1.60‡	1.60§	1.00¶	.....

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.80	1.70	1.45	1.20	1.05	.....
Duluth, Minn.	.90	2.00	1.75	1.55	1.25	1.25
Dwight, Calif.	1.00	1.00	1.00	.90	.90	.....
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
Knippa, Tex.	2.50	2.25	1.65	1.35	1.25	.....
New Britain, Plainville, Rocky Hill, Wallingford, Meriden, Mt. Carmel, Conn.	.80	1.70	1.45	1.20	1.05	.....
Northern New Jersey	1.40	1.40	1.80	1.40	1.40	1.40
Oakland and El Cerito, Calif.	1.00	1.00	1.00	.90	.90	.....
Richmond, Calif.	.75	.....	1.00	1.00	1.00	.....
San Diego, Calif.	.50@ .75	1.25@1.50	1.25@1.50	1.10@1.25	1.10@1.25	.....
Springfield, N. J.	1.60	2.20	2.10	1.70	1.60	.....
Toronto, Ont.	.....	3.58@4.05	3.05@3.80	.....	.....	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley, Montello and Red Granite, Wis.—Granite	1.80	1.70	1.50	1.40	1.40	.....
Columbia, S. C.	.....	.....	2.00	1.80	1.65	.....
Eastern New York—Syenite	.75	1.25	1.25	1.25	1.25	1.25
Eastern Penn.—Sandstone	1.35	1.70	1.65	1.40	1.40	1.40
Eastern Penn.—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Emathla, Fla.			Crushed flint rock, 2.50 per cu. yd.			
Graystone, Ala.—Granite	.50	.....	.....	.....	.....	.....
Lithonia, Ga.	.75a	1.75b	1.60	1.45	1.35	.....
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.	3.00@3.50	.....	2.00@2.25	2.00@2.25	.....	1.25@3.00
Richmond, Calif.—Quartzite	.75	.....	1.00	1.00	1.00	.....
Rochester, N. Y.			Dolomite, all sizes, 1.50 per ton			
Somerset, Penn. (sand-rock)			1.50 to 1.85			
Toccoa, Ga.	.....	.....	1.40	1.25	1.25	1.25

*¼ to ½ in. †¼ to 1 in. ‡¾ to 1¼ in. §¼ to 2¼ in. ¶Dust.
‖Rip rap per ton. (a) Sand. (b) to ⅜ in. (c) 1 in., 1.40. (d) 2in., 1.30. (h) Less 10c discount. (i) Less 10% net ton. (l) Less .05. (e) Agstone to June 15, 1927. [1] ¾ to ¼ in. [2] 1 to ¾ in. [3] 1½ to ¾ in (A) Plus 4% sales tax, less 2% discount 30 days.

Agricultural Limestone

(Pulverized)

Alderson, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh	1.50
Alton, Ill.—Analysis, 98% $CaCO_3$, 0.01% $MgCO_3$; 90% thru 100 mesh	6.00
$MgCO_3$; 90% thru 100 mesh	4.50
Atlas, Ky.—90% thru 100 mesh	2.00
50% thru 100 mesh	1.00
Bettendorf and Moline, Ill.—Analysis, $CaCO_3$, 97%; 2% $MgCO_3$; 50% thru 100 mesh, 1.50; 50% thru 4 mesh	1.50
Blackwater, Mo.—100% thru 4 mesh	1.00
Branchton, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh	5.00
Cape Girardeau, Mo.—Analysis, $CaCO_3$, 93½%; $MgCO_3$, 3½%; 50% thru 50 mesh	1.50
Cartersville, Ga.—Pulverized limestone, 2.00; 50% thru 100 mesh	1.50
Charleston, W. Va.—Marl, per ton, bulk	3.00
Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk	2.50
Chico, Tex.—50% thru 50 mesh, 1.75; 50% thru 100 mesh	2.25
Cypress, Ill.—90% thru 100 mesh	1.35
Ft. Springs, W. Va.—50% thru 50 mesh	1.50
Hartford, Conn.—Paper bags, 4.25; cloth bags, 4.75; bulk	3.25
Hillsville, Penn.—Analysis, 94% $CaCO_3$; 1.40% $MgCO_3$; 75% thru 100 mesh; sacked	5.00
Hot Springs and Greensboro, N. C.—Analysis, $CaCO_3$, 98-99%; $MgCO_3$, 42%; pulverized; 67% thru 200 mesh; bags	3.95
Bulk	2.70
Jamesville, N. Y.—Analysis 89% $CaCO_3$, 4% $MgCO_3$; pulverized; bags, 4.25; bulk	2.75
Joliet, Ill.—Analysis, 52% $CaCO_3$; 44% $MgCO_3$; 90% thru 100 mesh	3.50
Knoxville, Tenn.—80% thru 100 mesh; bags, 3.95; bulk	2.70
Ladds, Ga.—Analysis, $CaCO_3$, 64%; $MgCO_3$, 32%; pulverized; 50% thru 50 mesh	1.50@ 2.75
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.00; bulk	3.50
Marlbrook, Va.—Analysis, 80% $CaCO_3$; 10% $MgCO_3$; bulk, 1.75; bags	3.75
Marl—Analysis, 90% $CaCO_3$; 10% $MgCO_3$; bulk, 2:25; bags	4.00
Marion, Va.—Analysis, 90% $CaCO_3$, pulverized, per ton	2.00
Middlebury, Vt.—Analysis, 90.05% $CaCO_3$; 90% thru 50 mesh	6.00
Milltown, Ind.—Analysis, 94.50% $CaCO_3$, 33% thru 50 mesh, 40% thru 50 mesh; bulk	1.35@ 1.60
Olive Hill, Ky.—90% thru 4 mesh	1.00
Piqua, Ohio—Total neutralizing power 95.3%; 99% thru 10, 60% thru 50; 50% thru 100	2.50@ 2.75
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.10; bulk	3.60
99% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Rocky Point, Va.—Analysis, $CaCO_3$, 97%; 50% thru 200 mesh, burlap bags, 3.50; paper, 3.25; bulk	2.00
Syracuse, N. Y.—Analysis 89% $CaCO_3$; $MgCO_3$, 4%; bags, 4.25; bulk	2.75
Toledo, Ohio—30% thru 50 mesh	2.25
Watertown, N. Y.—Analysis, 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50
West Stockbridge, Mass.—Analysis, 90% $CaCO_3$, 50% thru 100 mesh; cloth bags, 4.75; paper, 4.25; bulk	3.25
Carload, 7.50; less than carload	9.00

Agricultural Limestone

(Crushed)

Alton, Ill.—Analysis, 99% $CaCO_3$, 0.3% $MgCO_3$; 50% thru 4 mesh	3.00
Atlas, Ky.—90% thru 4 mesh	1.00
Bedford, Ind.—Analysis, 98.5% $CaCO_3$, 0.5%; $MgCO_3$; 90% thru 10 mesh	1.50

(Continued on next page)

Agricultural Limestone

Bridgeport and Chico, Texas—Analysis, 94% $CaCO_3$, 2% $MgCO_3$; 90% thru 100 mesh	3.50
Chicago, Ill. — 50% thru 100 mesh; 90% thru 4 mesh	.80
Columbia, Krause, Valmeyer, Ill. — Analysis, 90% $CaCO_3$; 100% thru 4 mesh	1.10@ 1.50
Cypress, Ill.—90% thru 50 mesh, 50% thru 100 mesh, 90% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh	1.35
Danbury, Conn.—Analysis, 79% $CaCO_3$, 11% $MgCO_3$; 60% thru 100 mesh; 80% thru 50 mesh; 100% thru 4 mesh; bags, 4.25; bulk	3.25
Dundas, Ont.—Analysis, 54% $CaCO_3$; $MgCO_3$, 43%; 50% thru 50 mesh	1.00
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh	1.50
Kansas City, Mo. — 50% thru 100 mesh	1.00
Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% thru 10 mesh; 46% thru 60 mesh	2.00
Screenings (¼ in. to dust)	1.00
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92¼ $MgCO_3$, 32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk	1.60
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 50% thru 50 mesh	1.85@ 2.35
McCook, Ill.—90% thru 4 mesh	.90
Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind.—Analysis, 42% $CaCO_3$, 54% $MgCO_3$; meal, 100% thru 4 mesh; 20% thru 100 mesh	1.50
Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Mountville, Va. — Analysis, 62.54% $CaCO_3$; $MgCO_3$, 35.94%, 100% thru 20 mesh; 50% thru 100 mesh, bags	5.00
Pixley, Mo. — Analysis, 96% $CaCO_3$; 50% thru 50 mesh	1.25
50% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh	1.65
River Rouge, Mich. — Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk	.80@ 1.40
Stone City, Iowa — Analysis, 98% $CaCO_3$; 50% thru 50 mesh	.75
Tulsa, Okla.—Analysis $CaCO_3$, 86.15%, 1.25% $MgCO_3$, all sizes	1.25
Waukesha, Wis.—90% thru 100 mesh, 4.50; 50% thru 100 mesh	2.15

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk	3.00
Joliet, Ill.—Analysis, 55% $CaCO_3$; 45% $MgCO_3$; 95% thru 100 mesh; paper bags	4.50
Marblehead, Ohio—Analysis, 80% $CaCO_3$; 99.8% thru 100 mesh; bulk	3.25
Piqua, Ohio, sacks, 4.50@5.00; bulk	3.00@ 3.50
Rocky Point, Va.—85% thru 200 mesh, bulk	2.25@ 3.50
Waukesha, Wis.—90% thru 100 mesh, bulk	4.50

Glass Sand

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

Buffalo, N. Y.	2.00@ 2.50
Cedarville and S. Vineland, N. J.	1.75
Estill Springs and Sewanee, Tenn.	1.50
Franklin, Penn.	2.00
Gray Summit and Klondike, Mo.	1.75@ 2.00
Klondike, Mo.	2.00
Los Angeles, Calif.—Washed	5.00
Massillon, Ohio	3.00
Mendota, Va.	2.25@ 2.50
Michigan City, Ind.	.35
Mineral Ridge and Ohlton, Ohio	2.50
Oceanside, Calif.	3.00
Ohlton, Ohio	2.50
Ottawa, Ill.	1.25
Pittsburgh, Penn.	3.00@ 4.00
Red Wing, Minn.	1.50
Ridgway, Penn.	2.50
Rockwood, Mich.	2.75@ 3.25
Round Top, Md.	2.00
San Francisco, Calif.	4.00@ 5.00
Silica, Va.	2.00@ 2.50
St. Louis, Mo.	2.00
Sewanee, Tenn.	1.50
Thayers, Penn.	2.50
Zanesville, Ohio	2.50

Miscellaneous Sands

City or shipping point	Roofing sand	Traction
Beach City, Ohio		1.75
Chippewa Falls, Wis.		.25*
Columbus, Ohio		.15@ .30
Dresden, Ohio		1.25
Eau Claire, Wis.	3.00@ 4.30	1.00

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F.O.B., producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge & So. H'g'ts, Penn.	1.25	1.25	1.15	.85	.85	.85
Asbury Park, Spring Lake and Wayside, N. J.	.80	.70	1.25	1.50		
Attica and Franklinville, N. Y.	.75	.75	.75	.75	.75	.75
Boston, Mass.‡	1.40	1.40	2.25		2.25	2.25
Buffalo, N. Y.	1.10	1.05	1.05	1.05		1.05
Erie, Penn.		1.00*		1.50*	1.75*	
Leeds Junction, Me.		.50	1.75		1.25	1.00c
Machias Jct., N. Y.	.75	.75	.85	.75	.75	.75
Montoursville, Penn.	1.00	.75@ .85	.75	.75	.75	.75
Northern New Jersey	.50	.50	1.25	1.25	1.25	
Portland, Me.		1.00	2.25		2.00	
Shining Point, Penn.			1.00	1.00	1.00	1.00
Somerset, Penn.		2.00				
South Heights, Penn.	1.25	1.25	.85	.85	.85	.85
Washington, D. C.	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Algonquin and Beloit, Wis.	.50	.40	.60	.60	.60	.60
Appleton and Mankato, Minn.		.45	1.25	1.25	1.25	1.25
Attica, Ind.			All sizes .75@.85			
Aurora, Moronts, Oregon, Sheridan, Yorkville, Ill.	.25@ .80	.50@ .70	.10@ .40	.50@ .70	.60@ .80	.60@ .80
Barton, Wis.		.50	.50	.60	.60	.60
Chicago district, Ill.	.70	.55	.55	.60	.60	.60
Columbus, Ohio		.75	.75	.75	.75	
Des Moines, Iowa		.30	1.30	1.30	1.30	1.30
Eau Claire, Chippewa Fls., Wis.	.40	.40	.50@ .85	.85@ .90	.85@ .90	
Elkhart Lake, Wis.	.60	.40	.60	.60	.50	.50
Ferrysburg, Mich.		.50@ .80	.60@1.00	.60@1.00		.50@1.25
Ft. Dodge, Iowa	.85	.85	2.05	2.05	2.05	2.05
Grand Haven, Mich.		.60@ .80	.70@ .90	.70@ .90		.70@ .90
Grand Rapids, Mich.	.50	.50	.90	.80	.70	.70
Hamilton, Ohio		1.00			1.00	
Hersey, Mich.	.50	.50		.60		.70
Humboldt, Iowa	.50	.50	1.50	1.50	1.50	1.50
Indianapolis, Ind.	.60	.60	.75	.75	.75	.75
Joliet, Plainfield & Hammond, Ill.	.60	.50	.50	.60	.60	.60
Mason City, Iowa	.50@ .60	.50@ .60	1.30	1.30	1.20	1.20
Mankato, Minn.				1.25	1.25	1.25
Mattoon, Ill.			.75@.85 all sizes			
Milwaukee, Wis.	.96	.91	1.06	1.06	1.06	1.06
Minneapolis, Minn.	.65*	.65*	1.75*	1.75*	1.75*	1.75*
Moline, Ill.	.60@ .85	.60@ .85	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Northern New Jersey	.40@ .50	.40@ .50	1.40	1.35	1.25	
Pittsburgh, Penn.	1.25	1.25	.85	.85	.85	.85
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
St. Louis, Mo.	1.20e	1.45f	1.55a	1.45	1.45	1.45
St. Paul, Minn.	.35	.35	1.25	1.25	1.25	1.25
Terre Haute, Ind.	.75	.60	.85	.80	.75	.75
Wolcottville, Ind.	.75	.75	.75	.75	.75	.75
Waukesha, Wis.		.45	.60	.60	.65	.65
Winona, Minn.	.40	.40	1.50	1.25	1.25	1.15
Zanesville, Ohio		.60	.50	.60	.80	
SOUTHERN:						
Charleston, W. Va.			River sand and gravel, all sizes, 1.40			
Brewster, Fla.		.45	2.25			
Brookhaven, Miss.	1.25	.70	1.25	1.00	.70	.70
Chattahoochie River, Fla.		.70		1.75		
Eustis, Fla.		.50@ .60				
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.20
Macon, Ga.		.50	.50			
New Martinsville, W. Va.	1.00	.90@1.00		1.10@1.20		.80@ .90
Roseland, La.	.25	.25	1.25	1.00	.65	.65
WESTERN:						
Kansas City, Mo.		.70@ .75				
Crushton, Durbin, Kincaid, Largo, Rivas, Calif.	.10@ .40	.10@ .40	.50@1.00	.50@1.00	.50@1.00	.50@1.00
Oregon City, Ore.	1.25*	1.25*	1.25*	1.25*	1.25*	1.25*
Phoenix, Ariz.		1.00*	2.00*	2.00*	1.10*	1.00*
Pueblo, Colo.	.70	.60		1.20		1.15
San Diego, Calif.		.40@ .50	.80@1.00	.80@1.00	.65@ .80	.65@ .80
Seattle, Wash.	1.25	1.25	1.25	1.25	1.45	1.25

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.			Dust to 3 in., .40			
Brookhaven, Miss.						.60
Buffalo, N. Y.	1.10	.95		.85		.85
Burnside, Conn.	.75					
Des Moines, Iowa	.50					
Dresden, Ohio	.50	.60	.70	.65	.65	.60
East Hartford, Conn.	.85*d					
Eau Claire, Chippewa Fls., Wis					.65	
Gainesville, Texas					.55	
Grand Rapids, Mich.				.50		
Hamilton, Ohio					1.00	
Hersey, Mich.				.50		
Indianapolis, Ind.			Mixed gravel for concrete work, at .65			
Lindsay, Texas		1.10			.55	
Macon, Ga.	.35					
Mankato, Minn.	.30					
Moline, Ill. (b)	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Oregon City, Ore.	1.25*	1.25*	1.25*	1.25*	1.25*	1.25*
Roseland, La.					.50	
Somerset, Penn.		1.85@2.00		1.50@1.75		
St. Louis, Mo.			Mine run gravel, 1.55 per ton			
Summit Grove, Ind.	.50	.50	.50	.50	.50	.54
Winona, Minn.	.60	.60	60	.60	.60	.60
York, Penn.	1.10	1.00				

*Cubic yd. ‡Delivered on job by truck. (a) ⅝-in. down. (b) River run. (c) 2½-in. and less *By truck only. (d) Delivered in Hartford, Conn., $1.50 per yd. (e) Mississippi River. (f) Meramec River.

Core and Foundry Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

City or shipping point	Molding, fine	Molding, coarse	Molding, brass	Core	Furnace lining	Sand blast	Stone sawing
Aetna, Ill.				.30@ .35			
Albany, N. Y.	2.10	2.00	2.25	1.50		4.00g	
Arenzville, Ill.	1.50@1.75			1.00			
Beach City, Ohio	1.75	1.75		1.75	1.75@2.00		
Buffalo, N. Y.	1.50	1.50		2.00@2.50			
Cedarville and S. Vineland, N. J.				2.25			
Columbus, Ohio	1.50@2.00	1.25@1.50	2.00	.30	1.75@2.00	2.75@4.50	
Dresden, Ohio	1.50@1.75	1.35@1.50	1.50@1.75	1.25	1.35		
Eau Claire & Chippewa Falls, Wis.						3.00	
Elco & Tamms, Ill.	Ground silica per ton in carloads—18.00@31.00						
Estill Springs and Sewanee, Tenn.	1.25			1.25		1.35@1.50	
Franklin, Penn.	1.75	1.75		1.75	1.75		
Kasota, Minn.							1.00
Klondike, Mo.				2.00	2.00		2.00
Massillon, Ohio	2.25	2.25		2.25	2.50		
Mendota, Va.	Ground flint or silex—16.00@20.00 per ton						
Michigan City, Ind.				.30@ .35			
Millville, N. J.				1.75b		3.50	
Montoursville, Penn.				1.35@1.60	1.25@1.35		
New Lexington, O.	1.75	1.25					
Ohlton, Ohio	1.75	1.75		2.00b	1.75b	1.75b	
Ottawa, Ill.						3.50	
Red Wing, Minn.(d)					1.50	3.00	1.50
Ridgway, Penn.	1.50	1.50	1.75@2.00c				
Round Top, Md.				1.60		2.25	
San Francisco, Calif.[1]	3.50†	5.00†	3.50†	3.50@5.00†	3.50@5.00†	3.50@5.00†	
Silica, Va.	Ground glass sand, 140-mesh, per ton, 8.00@10.00						
Thayers, Penn.	1.25	1.25		2.00			
Utica, Ill.	.60	.65		.70	.75		
Utica, Penn.	1.75	1.75		2.00			
Warwick, Ohio	1.75*@2.00	1.75*@2.00	1.75	1.75*@2.00	1.75		
Zanesville, Ohio	2.00	1.50	2.00	2.00	2.00		

*Green. †Fresh water washed, steam dried. [1]Core, washed and dried, 2.50. (b) Damp. (c) Shipped from Albany. (g) Dry. (d) Filter sand, 3.00.

Crushed Slag

City or shipping point	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in. and less	2½ in. and less	3 in. and larger
EASTERN:							
Buffalo, N. Y., Erie and Dubois, Pa.	2.25	1.25	1.35	1.25	1.25	1.25	1.25
Eastern Penn.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Reading, Penn.	2.50	1.25		1.00			
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	2.05*	1.30*	1.80*	1.45*		1.45*	
Jackson, Ohio	1.75*	1.05*	1.55*	1.30*	1.05*	1.30*	
Toledo, Ohio	1.50	1.25	1.25	1.25	1.25	1.25	1.25
Youngst'n. O., dist.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.		1.45*		1.45*	1.45*	1.45*	
Ensley and Alabama City, Ala.	2.05	.80	1.35	1.25	.90	.90	.80
Longdale, Roanoke, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15
Woodward, Ala.	2.05*	.80*	1.35*	1.25*	.90*	.90*	

*5c per ton discount on terms.

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
EASTERN:								
Berkeley, R. I.			12.00					2.00
Buffalo, N. Y.		12.00	12.00	12.00			10.00	1.95[4]
Chazy, N. Y.		8.50	7.50	10.00		15.50[1]	8.50	14.00
Lime Ridge, Penn.					5.00[2]			
Pittsburgh, Penn.	12.50	8.50	8.50		9.00	11.00		
West Stockbridge, Mass.	12.00	10.00	5.60					2.00[12]
Williamsport, Penn.			10.00				6.00	
York, Penn.		9.50	9.50	10.50	8.50	10.50	8.50	1.65[7]
CENTRAL:								
Afton, Mich.							7.50	1.35
Carey, Ohio	11.50	7.50	7.50		9.00		8.00	1.50
Cold Springs, Ohio		8.50	8.50				8.00	
Cold Springs and Gibsonburg, Ohio	12.50	8.50	8.50		9.00	11.00		
Huntington, Ind.	12.50	8.50	8.50		9.00		8.00	
Luckey, Ohio[6]	11.50	8.50	8.50					1.50[3]
Milltown, Ind.		8.50@10.00		10.00[8]			8.50[22]	1.35[10]
Scioto & Marble Cliff, O.		8.50	8.50	9.50	8.25	.62½	7.50	1.50[3]
Sheboygan, Wis.		11.50			9.50			2.00[4]
Wisconsin points[6]		11.50					9.50	
Woodville, Ohio	11.50	8.50	8.50	12.50	9.00	11.00[9]	9.00	1.50[3]
SOUTHERN:								
Allgood, Ala.	12.50	10.00			8.50		8.50	1.50
El Paso, Texas.							7.00	1.50
Frederick, Md.		9.00	9.00	9.50	7.50	9.00	7.50	9.00
Graystone & Landmark, Ala.	12.50	10.00	10.00	10.00			8.50	1.50
Keystone, Ala.		10.00	8.00	10.00	8.00		8.00	1.50
Knoxville, Tenn.	20.25	10.00	10.00	10.00			8.50	1.50
New Braunfels, Tex.	18.00	12.00	10.00	12.00	10.00		9.50	
Ocala, Fla.		11.00	9.00				10.00	1.40
Saginaw, Ala.	12.50	10.00	9.00	10.00			8.50	1.50
WESTERN:								
Kirtland, N. M.							15.00	
Limestone, Wash.	15.00	15.00	10.00	15.00	16.50	16.50	16.50	2.09
Los Angeles, Calif.	19.00	19.00	14.00		16.20		12.50	2.50
Dittlinger, Tex.		12.00@13.00					9.50[8]	1.50[23]
San Francisco, Calif.	20.00	20.00	13.50	21.00			14.50[30]	2.15
Tehachapi, Calif.[13]	17.00	15.00	12.00@15.00[11]	17.00	16.00		16.00	2.00
Seattle, Wash.	19.00	19.00	12.00	19.00	19.00		18.60	2.30

[1] Barrels. [2] Net ton. [3] Wooden, steel 1.70. [4] Steel. [5] 180 lb. [6] Dealers' prices, net 30 days less 23c discount per ton on hydrated lime and 5c per bbl. on lump if paid in 10 days. [7] 180-lb. net barrel. 1.65: 280-lb. net barrel, 2.65. [8] To 11.00 [9] 80-lb. [10] To 1.50. [11] Refuse or air slack, 10.00@12.00 [12] To 3.00. [13] Delivered in Southern California. [22] To 9.00. [23] To 1.60. [30] To 16.50.

Miscellaneous Sands

(Continued)

City or shipping point	Roofing Sand	Traction
Estill Springs and Sewanee, Tenn.	1.35@ 1.50	1.35@ 1.50
Franklin, Penn.		1.75
Massillon, Ohio		2.00
Michigan City, Ind.		.30
Montoursville, Penn.		1.10
Ohlton, Ohio	*1.75	*1.75
Red Wing, Minn.		1.00
Round Top, Md.	2.25	1.75
San Francisco, Calif.	3.50	3.50
Thayers, Penn.		2.25
Warwick, Ohio		2.00
Zanesville, Ohio		2.50

*Damp.

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:	
Crude talc (mine run)	3.00@ 4.00
Ground talc (20-50 mesh), bags	10.00
Cubes	55.00
Blanks (per lb.)	.08
Pencils and steel crayons, gross	1.00@ 2.80
Chatsworth, Ga.:	
Crude talc, grinding	5.00
Ground talc (150-200 mesh)	10.00
Pencils and steel worker's crayons, per gross	1.00@ 2.00
Chester, Vt.:	
Ground talc (150-200 mesh), paper bags	9.50@10.50
Same, burlap bags, bags extra	8.50@ 9.50
Chicago and Joliet, Ill.:	
Ground (150-200 mesh), bags	30.00
Dalton, Ga.:	
Crude talc (for grinding)	5.00
Ground talc (150-200 mesh), bags	12.00
Pencils and steel worker's crayons, per gross	1.00@ 2.50
Emeryville, N. Y.:	
(Double air floated) including bags;	
325 mesh	14.75
200 mesh	13.75
Glendon, N. C.:	
Ground talc (150-200 mesh), bulk	6.00@10.00
Ground talc (150-200 mesh), bags	8.00@14.00
Pencils and steel crayons, gross	1.05@ 2.00
Blanks, .08 per lb.; cubes	50.00
Hailesboro, N. Y.:	
Ground white talc (double and triple air floated) 200-lb. bags, 300-350-mesh	15.50@20.00
Henry, Va.:	
Crude (mine run)	3.50@ 4.00
Ground talc (150-200 mesh), bags	7.50@16.00
Joliet, Ill.:	
Crude talc	5.00
Southern talc	17.00
Illinois talc	10.00
Keeler, Calif.:	
Ground (200-300 mesh), bags	20.00@30.00
Natural Bridge, N. Y.:	
Ground talc (125-200 mesh), bags	10.00@15.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock	
Columbia, Tenn.—B.P.L. 65-70%	3.50@ 4.50
Gordonsburg, Tenn.—B.P.L. 65-70%	3.75@ 4.50
Mt. Pleasant, Tenn.—B.P.L. 72%	5.00@ 5.50
Tennessee — F.o.b. mines, gross ton, unground brown rock, B.P.L. 72%	5.00
B.P.L. 75%	6.00
Twomey, Tenn.—B.P.L. 65%, 2000 lb.	8.00@ 9.00
Ground Rock (2000 lb.)	
Centerville, Tenn.—B.P.L. 65%	8.00
Gordonsburg, Tenn.—B.P.L. 65-70%	4.00@ 4.50
Mt. Pleasant, Tenn.—B.P.L. 72.5%	9.50
Twomey, Tenn.—B.P.L. 65%	8.00@ 9.00

Florida Phosphate

(Raw Land Pebble)

(Per Ton)

Florida — F.o.b mines, gross ton, 68/66% B.P.L.. Basis 68%	3.25
70% min. B.P.L., Basis 70%	3.75

Mica

Prices given are net, f.o.b. plant or nearest shipping point.

Pringle, S. D.—Mine run, per ton	125.00
Punch mica, per lb.	.06
Scrap, per ton, carloads	20.00
Rumney Depot, N. H.—Per ton,	
Mine run	300.00
Clean shop scrap	25.00
Mine scrap	22.50@24.00
Roofing mica	37.50
Punch mica, per lb.	.12
Cut mica—50% from Standard List.	

Special Aggregates

Prices are per ton f.o.b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco-chips
Barton, Wis., f.o.b. cars	.....	10.50
Brandon, Vt. — English pink, English cream and coral pink	*12.50	*12.50
Brandon grey	*12.50	*12.50
Brighton, Tenn.— All colors and sizes	§3.00	§3.00
Buckingham, Que.—Buff stucco dash	.....	12.00@14.00
Chicago, Ill. — Stucco chips, in sacks, f.o.b. quarries	.....	17.50
Crown Point, N. Y.— Mica spar	.....	9.00@10.00
Dayton, Ohio	.....	6.00@24.00
Easton, Penn.— Green stucco	.....	12.00@18.00
Green granite	.....	14.00@20.00
Haddam, Conn.—Felstone buff	15.00	15.00
Harrisonburg, Va.—Bulk marble (crushed, in bags)	†12.50	†12.50
Ingomar, Ohio—Concrete facings and stucco dash	.....	10.00@20.00
Middlebrook, Mo.—Red	.....	20.00@25.00
Middlebury, Vt.—Middlebury white	‡9.00	‡9.00
Middlebury and Brandon, Vt.—Caststone, per ton, including bags	.....	5.50@ 7.50
Milwaukee, Wis.	.....	14.00@34.00
New York, N. Y.—Red and yellow Verona	.....	32.00
Phillipsburg, N. J.— Royal green granite	.....	15.00@17.00
Randville, Mich.— Crystalite crushed white marble, bulk	4.50@ 6.00	4.50@ 7.50
Rose pink granite, bulk	.....	12.00
Stockton, Calif.—"Natrock" roofing grits	.....	12.00@20.00
Tuckahoe, N. Y.—Tuckahoe white	12.00	.....
Wauwatosa, Wis.	.....	20.00@32.00
Wellsville, Colo. — Colorado Travertine Stone	15.00	15.00

*Carloads, including bags; L.C.L. 14.50.
†C.L. L.C.L. 17.00.
‡Carloads, including bags; L.C.L. 10.00.
§Bulk, car lots, minimum 30 tons.

Potash Feldspar

Auburn and Topsham, Me. — Color white, 98% thru 160-mesh	19.00
Bristol, Tenn.—Color, white; analysis, K_2O, 6 to 10%; Na_2O, 2½ to 4%; SiO_2, 68 to 78%; Fe_2O_3, 12 to 20%; Al_2O_3, 16.5 to 18.5%; 99% thru 200 mesh; bulk, depending on grade	14.50@18.00
Brunswick, Me.—Color, white; 99% thru 140 mesh, bulk	19.00
Buckingham, Ore.—White, analysis, K_2O, 12-13%; Na_2O, 1.75%; bulk	9.00
De Kalb Jct., N. Y.—Color, white, bulk (crude)	9.00
East Hartford, Conn.—Color, white, 95% thru 60 mesh, bags	16.00
96% thru 150 mesh, bags	28.00
East Liverpool, Ohio—Color, white; 98% thru 200 mesh, bulk	19.35
Soda feldspar, crude, bulk, per ton	22.00
Glen Tay Station, Ont.—Color, red or pink; analysis, K_2O, 12.81%; crude	7.00
Keystone, S. D.—White; bulk (crude)	8.00
Los Angeles, Calif.—Color, white; analysis, K_2O, 12.16%; Na_2O, 1.53%; SiO_2, 65.60%; Fe_2O_3, .10%; Al_2O_3, 10.20%; crude	10.00
Pulverized, 95% thru 200 mesh; bags, 22.00; bulk	22.00
Murphysboro, Ill.—Color, prime white; analysis, K_2O, 12.60%; Na_2O, 2.35%; SiO_2, 63%; Fe_2O_3, .06%; Al_2O_3, 18.20%; 98% thru 200 mesh; bags, 21.00; bulk	20.00
Penland, N. C.—White; crude, bulk	8.00
Ground, bulk	16.50
Spruce Pine, N. C.—Color, white; analysis, K_2O, 10%; Na_2O, 3%; Si_2O, 68%; Fe_2O_3, 0.10%; Al_2O_3, 18%; 99½% thru 200 mesh; bulk	18.00
Crude	9.00
Tenn. Mills—Color, white; analysis K_2O, 18%; Na_2O_3, 10%; 68% SiO_2; 99% thru 200 mesh; bulk	18.00
99% thru 140 mesh, bulk	16.00
Toronto, Can.—Color, flesh; analysis K_2O, 12.75%; Na_2O, 1.96%; crude	7.50@ 8.00

Chicken Grits

Afton, Mich.(Limestone), per ton	1.75
Belfast and Rockland, Me.—(Limestone), bags, per ton	10.00
Cartersville, Ga.—(Limestone), per bag	2.00
Centerville, Iowa—(Gypsum), per ton	18.00
Chico and Bridgeport, Tex.—Hen	¶9.00
Baby chick, per ton	¶8.00
Danbury, Conn.—(Limestone), bulk	6.00@ 7.00
Easton, Penn.—Per ton, bulk	3.00
Joliet, Ill.—(Limestone), bags, per ton	4.50
Knoxville, Tenn.—Per bag	1.25
Los Angeles, Calif.—(Feldspar), per ton	15.00
Gypsum, Ohio—(Gypsum), per ton	10.00
Hartford, Conn.	‡7.50@*9.00
Limestone, Wash. — (Limestone), per ton	12.50
Marion, Va.—(Limestone), bulk, 5.00; bagged, 6.50; 100-lb. bag	.50
Middlebury, Vt.—Per ton	10.00
Rocky Point, Va.—(Limestone), 100-lb. bags, 50c; sacks, per ton, 6.00; bulk	5.00
Seattle, Wash.—(Limestone), bulk, per ton	10.00
Warren, N. H.—(Mica), per ton	3.85@ 3.90
Waukesha, Wis.—(Limestone), per ton	20.00
West Stockbridge, Mass.—(Limestone), bulk	‡7.50@*9.00
Wisconsin Points—(Limestone), per ton	9.00

*L.C.L. †Less than 5-ton lots. ‡C.L. ¶100-lb. bags.

Sand-Lime Brick

Prices given per 1000 brick f.o.b. plant or nearest shipping point, unless otherwise noted.

Albany, Ga.	9.00
Anaheim, Calif.	10.50@11.00
Barton, Wis.	10.50
Boston, Mass.	17.00*
Brighton, N. Y.	19.75*
Brownstone, Penn.	11.00
Dayton, Ohio	12.50@13.50
Detroit, Mich.	16.00*
Farmington, Conn.	13.00
Flint, Mich.	¶12.00@17.50*
Grand Rapids, Mich.	12.50
Hartford, Conn.	14.00@19.00*
Jackson, Mich.	12.25
Lakeland, Fla.	10.00@11.00
Lake Helen, Fla.	9.00@12.00
Lancaster, N. Y.	12.50
Madison, Wis.	12.50a
Michigan City, Ind.	11.00
Milwaukee, Wis.	10.50@13.00*
Minneapolis and St. Paul, Minn.	10.00
Minnesota Transfer	10.00
New Brighton, Minn.	10.00
Pontiac, Mich.	16.00@17.00
Portage, Wis.	16.00
Prairie du Chien, Wis.	18.00@22.50
Rochester, N. Y.	19.75*
Saginaw, Mich.	13.50
San Antonio, Texas	16.00
Sebewaing, Mich.	12.00
Sioux Falls, S. Dak.	13.00
South River, N. J.	13.00
Syracuse, N. Y.	18.00@20.00
Toronto, Canada	16.00*†
Wilkinson, Fla.	12.00@16.00
Winnipeg, Canada	14.00

*Delivered on job. †5% disc., 10 days. ¶Dealers' price. (a) Less 50c discount per M., 10 days.

Portland Cement

Prices per bag and per bbl., without bags, net in carload lots.

	Per Bag	Per Bbl.
Albuquerque, N. M.	.84¼	3.37
Atlanta, Ga.	.....	2.35
Baltimore, Md.	.....	2.15@2.25
Birmingham, Ala.	.....	2.30
Boston, Mass.	.....	2.13@2.23
Buffalo, N. Y.	.....	2.20@2.30
Butte, Mont.	.90¼	3.61
Cedar Rapids, Iowa	.....	2.24
Charleston, S. C.	.....	2.35
Cheyenne, Wyo.	.82¾	3.31
Cincinnati, Ohio	.58	2.32
Cleveland, Ohio	.....	2.24
Chicago, Ill.	.51¼	2.05
Columbus, Ohio	.57¼	2.29
Concrete, Wash.	.....	2.35
Dallas, Texas	.....	2.00
Davenport, Calif.	.....	2.45*
Davenport, Iowa	.....	2.24
Dayton, Ohio	.58¼	2.33
Denver, Colo.	.66¼	2.65
Des Moines, Iowa	.....	2.05
Detroit, Mich.	.....	2.00
Duluth, Minn.	.....	2.04
Houston, Texas	.....	2.00
Indianapolis, Ind.	.54¾	2.19
Jackson, Miss.	.....	2.30
Jacksonville, Fla.	.....	2.20
Jersey City, N. J.	.....	2.03@2.13
Kansas City, Mo.	.....	1.92
Los Angeles, Calif.	.60	2.40
Louisville, Ky.	.55½	2.22
Memphis, Tenn.	.....	2.30
Milwaukee, Wis.	.....	2.00@2.20
Minneapolis, Minn.	.....	2.12@2.22
Montreal, Que.	.....	1 36
New Orleans, La.	.....	2.20
New York, N. Y.	.....	1.93@2.03
Norfolk, Va.	.....	2.07
Oklahoma City, Okla.	.....	2.46
Omaha, Neb.	.....	2.36
Peoria, Ill.	.....	2.22
Philadelphia, Penn.	.....	2.11@2.21
Phoenix, Ariz.	.76½	3.06
Pittsburgh, Penn.	.....	2.04
Portland, Colo.	.....	2.80
Portland, Ore.	.....	2.60‡@2.70
Reno, Nev.	.....	2.91
Richmond, Va.	.....	2.24@2.34
Salt Lake City, Utah	.70¼	2.81
San Francisco, Calif.	.....	2.21
Savannah, Ga.	.....	2.50
St. Louis, Mo.	.51¼	2.05
St. Paul, Minn.	.....	2.12@2.22
Seattle, Wash.	.....	2.50†@2.65
Tampa, Fla.	.....	2.25
Toledo, Ohio	.....	2.20
Topeka, Kan.	.....	2.41
Tulsa, Okla.	.....	2.33
Wheeling, W. Va.	.....	2.12
Winston-Salem, N. C.	.....	2.59

Mill prices f.o.b. in carload lots, without bags, to contractors.

	Per Bag	Per Bbl.
Albany, N. Y.	.43¾	1.75
Buffington, Ind.	.....	1.80
Chattanooga, Tenn.	.....	2.45*
Concrete, Wash.	.....	2.35
Davenport, Calif.	.....	2.45*
Detroit, Mich.	.....	2.15
Hannibal, Mo.	.....	1.90
Hudson, N. Y.	.....	1.75
Leeds, Ala.	.....	1.65
Lime and Oswego, Ore.	.....	2.70‡
Mildred, Kan.	.....	2.35
Nazareth, Penn.	.....	2.15
Northampton, Penn.	.....	1.75
Richard City, Tenn.	.....	2.05
Steelton, Minn.	.....	1.85
Toledo, Ohio	.....	2.20
Universal, Penn.	.....	2.30

NOTE—Add 40c per bbl. for bags.
*Includes sacks.
†10c discount, 10 days. ‡10c discount, 15 days.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F.O.B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	Gauging White	Plaster Sanded	Cement Keene's	Finish Trowel	—Plaster Board— ¼x32x 36". Per M Sq. Ft.	—Plaster Board— ⅜x32x 36". Per M Sq. Ft.	Wallboard, ⅜x32 or 48". Lengths 6'-10'. Per M Sq. Ft.
Arden, Nev., and Los Angeles, Calif.	3.00	8.00u	8.00u	10.70u	10.70u	.....	.....	.....	.....	11.70u	.....	.....	.....
Centerville, Iowa	3.00	10.00	15.00	10.00	10.00	10.50	13.50	.....	.....	13.50	.....	.....	.....
Des Moines, Iowa	3.00	8.00	9.00	10.00	10.00	10.50	13.50	12.00	24.00	22.00	18.00	21.00	30.00
Detroit, Mich.	.....	.....	.....	.....	14.30o	12.30m	.....	m9.00@11.00o	.....	.....	.....	.....	.....
Delawanna, N. J.	.....	.....	.....	.....	.....	8.00	.....	9.00	.....	.....	.14½	.15½	30.00
Douglas, Ariz.	.....	.....	6.00	14.50	15.00	.....	18.00	.....	30.00	.....	.....	.....	.....
Grand Rapids, Mich.	2.75	6.00	6.00	8.00	9.00	9.00	17.50	.....	24.55	20.00	.....	.....	.....
Gypsum, Ohio	3.00	4.00	6.00	7.00	9.00	9.00	19.00	7.00	24.50	19.00	.....	15.00	30.00
Los Angeles, Calif.	.....	.....	7.50@9.50	11.50y	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Clinton, Ohio	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	.....	9.00	13.40	14.40	.....	15.40	.....	.....	.....	.....	.....	.....
Seattle, Wash.	6.00	10.50	10.50	13.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sigurd, Utah	.....	.....	.....	.....	.....	.....	.....	.....	21.50	.....	.....	.....	.....
Winnipeg, Man.	5.00	5.00	7.00	13.00	14.00	14.00	.....	.....	.....	.....	20.00	25.00	33.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable).
(m) Includes paper bags; (o) includes jute sacks; (u) includes sacks; (y) sacks 15c extra, rebated.

Market Prices of Cement Products

Concrete Block

Prices given are net per unit, f.o.b. plant or nearest shipping point

City or shipping point	Sizes 8x8x16	8x10x16	8x12x16
Camden, N. J.	17.00	.....	.....
Cement City, Mich.		5x8x12—55.00¶	
Columbus, Ohio	17.00c@19.00a	.....	.....
Detroit, Mich. (d)	.16	.....	.18
Forest Park, Ill.	21.00*	.....	.....
Grand Rapids, Mich.	15.00@16.00a	.....	.....
Graettinger, Iowa	.18@ .20	.....	.....
Indianapolis, Ind	.13@ .15†	.....	.....
Los Angeles, Calif.¶	5¾x3½x12—55.00	7¾x3½x12—65.00	
Oak Park, Ill.	20.00	.....	.....
Olivia and Mankato, Minn.	9.50b	.....	.....
Somerset, Penn.	.20@ .25	.....	.....
Tiskilwa, Ill.	.16@ .18†	.....	.....
Yakima, Wash.	20.00*	.....	.....

*Price per 100 at plant. †Rock or panel face. (a) Face. ‡Delivered. ¶Price per 1000. (b) Per ton. (c) Plain. (d) 5x8x12—65.00 M, 5½x8x12—68.50 M.

Cement Roofing Tile

Prices are net per sq. in. carload lots, f.o.b. nearest shipping point, unless otherwise stated.

Camden and Trenton, N. J.—8x12, per sq.	
Red	15.00
Green	18.00
Chicago, Ill.—Per sq.	20.00

Cicero, Ill.—Hawthorne roofing tile, per sq.

	Chocolate, Red, Yellow, Gray, and Orange	Green, Blue
French and Spanish†	$11.50	$13.50
Ridges (each)	.25	.35
Hips	.25	.35
Hip starters	.50	.60
Hip terminals, 2-way	1.25	1.50
Hip terminals, 4-way	4.00	5.00
Mansard terminals	2.50	3.00
Gable finials	1.25	1.50
Gable starters	.25	.35
Gable finishers	.25	.35
*End bands	.25	.35
*Eave closers	.06	.08
*Ridge closers	.05	.06

*Used only with Spanish tile.
†Price per square.

Houston, Texas—Roofing Tile, per sq.	25.00
Indianapolis, Ind.—9x15-in.	Per sq.
Gray	10.00
Red	11.00
Green	13.00
Waco, Texas:	Per sq.
4x4	.60

Cement Building Tile

Cement City, Mich.:	Per 100
5x8x12	5.00
Grand Rapids, Mich.:	
5x8x12	8.00
5x4x12	4.50
Longview, Wash.: (Stone-Tile)	Per 1000
4x6x12	55.00
4x8x12	64.00
Mt. Pleasant, N. Y.:	Per 1000
5x8x12	78.00
Grand Rapids, Mich.:	Per 100
5x8x12	7.00
Houston, Texas:	
5x8x12 (Lightweight)	80.00
Pasadena, Calif. (Stone Tile):	Per 100
3½x4x12	3.00
3½x6x12	4.00
3½x8x12	5.50
Tiskilwa, Ill.:	Per 100
8x8	15.00
Wildasin Spur, Los Angeles, Calif. (Stone-Tile):	Per 1000
3½x6x12	50.00
3½x8x12	60.00
Prairie du Chien, Wis.:	
5x8x12	82.00
5x4x12	46.00
5x8x 6 (half-tile)	41.00
5x8x10 (fractional)	82.00
Yakima, Wash. (Building Tile):	
5x8x12	.10

Cement Drain Tile

Graettinger, Iowa—5 to 36 in., per ton	8.00
Olivia and Mankato, Minn.—Cement drain tile, per ton	8.00
Tacoma, Wash.—Drain tile, per ft.:	
3 in.	.04
4 in.	.05
6 in.	.07½
8 in.	.10
Waukesha, Wis.—Drain tile, per ton	8.00

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00@40.00
Baltimore, Md. (Del. according to quantity)	15.50	22.00@50.00
Camden and Trenton, N. J.	17.00	.....
Ensley, Ala. ("Slagtex")	14.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Forest Park, Ill.	.....	37.00
Friesland, Wis.	22.00	32.00
Longview, Wash.*	15.00	22.50@65.00
Milwaukee, Wis.	15.00	20.00@50.00
Mt. Pleasant, N. Y.	.....	14.00@23.00
Oak Park, Ill.	.....	42.00
Omaha, Neb.	18.00	30.00@ 40.00
Pasadena, Calif.	10.00	.....
Philadelphia, Penn.	14.75	20.00
Portland, Ore.	17.50	23.00@55.00
	Mantel brick—100.00@150.00	
Prairie du Chien, Wis.	14.00	22.50@ 25.00
Rapid City, S. D.	17.00	25.00@ 40.00
Waco, Texas	16.50	32.50@125.00
Watertown, N. Y.	20.00	35.00
Westmoreland Wharves, Penn.	14.75	20.00
Winnipeg, Man.	14.00	22.00
Yakima, Wash.	22.50	.....

*40% off List.

Current Prices Cement Pipe

Prices are net per foot f.o.b. cities or nearest shipping point in carload lots unless otherwise noted.

Culvert and Sewer	4 in.	6 in.	8 in.	10 in.	12 in.	15 in.	18 in.	20 in.	22 in.	24 in.	27 in.	30 in.	36 in.	42 in.	48 in.	54 in.	60 in.
Detroit, Mich.								15.00 per ton									
Graettinger, Iowa	.04½d	.05½	.08½	.12½	.17½	.....	.40	.50	.60	.70	.....	.....	.....	.....	.....	.....	.....
Grand Rapids, Mich. (b)																	
Culvert pipe	.....	.....	.....	.60	.72	1.00	1.28	1.60†	.....	1.92	2.32	3.00	4.00	5.00	6.00	.....	.....
Sewer pipe (d)	.....	.....	.....	.....	.....	.63	.....	.60†	.....	.....	.....	.58	.....	.....	.....	.....	.....
Houston, Texas	.....	.19	.28	.43	.55½	.90	1.30	.....	1.70†	2.20	.....	.....	.....	.....	.....	.....	.....
Indianapolis, Ind. (a)	.....	.....	.....	.80	.90	1.10	1.30	.....	.....	1.70	.....	2.70	.....	.....	.....	.....	.....
Longview, Wash.								Sewer pipe 40% off list; culvert—list									
Mankato, Minn. (b)	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	1.75	2.50	3.25	4.25	.....	.....	.....
Newark, N. J.								6 in. to 24 in., $18.00 per ton									
Norfolk, Neb. (b)	.....	.....	.....	.90	1.00	1.13	1.42	.....	.....	2.11	.....	2.75	3.58	.....	6.14	.....	7.78
Olivia, Mankato, Minn.								12.00 per ton									
Paullina, Iowa‡	.....	.....	.....	.....	.....	.....	.....	2.25	.....	2.11	.....	2.75	3.58	.....	6.14	.....	7.78
Somerset, Penn.	.....	.....	.....	.....	1.08	1.25	1.65	.....	.....	2.50	.....	3.65	4.85	7.50	8.50	.....	.....
Tiskilwa, Ill. (rein.) (a)	.....	.....	.....	.65	.75	.85	.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wahoo, Neb. (b)	.....	.....	.....	.....	1.00	1.13	1.10	1.60	.....	1.90	.....	2.25	3.40	.....	5.50	.....	.....
Yakima, Wash.							1.42	.....	.....	2.11	.....	2.75	3.58	4.62	6.14	6.96	7.78
Tacoma, Wash.	.15	.18	.22½	.30	.40	.55	.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(a) 24-in. lengths; (b) Reinforced; (d) Eastern clay, list, 72% and 60% off.
†21-in. diam. ‡Price per 2-ft. length.

Mississippi Lime Co. Will Abandon Alton Lime Plant

THE Mississippi Lime and Material Co. of Alton, Ill., has decided to completely abandon its lime producing plant at Alton, following the completion of the company's new plant at St. Genevieve, Mo., which was recently put in operation. The decision was reached because the Alton lime rock tested only 95% $CaCO_3$, whereas the St. Genevieve rock shows 99%, which makes it much more desirable for the chemical lime users. The Alton plant is said to have been operating for more than 75 years.

The rock mine at Alton, which the company works instead of a quarry, will not be abandoned, however, but will produce crushed limestone from now on. It is expected that most of the product will be agricultural limestone. A large crushing plant is being erected which will have a capacity of 3000 tons a day. The new plant is to be electrically operated throughout. It is expected that it will be ready for operation early in 1928.—*Alton* (Ill.) *Telegraph.*

Texas Cement Rates Reduced

NO ACTION of the Texas railroad commission in recent years will have greater effect from a financial standpoint upon the cement industry of Texas than the order which it has just issued reducing the freight rates on the product from the six cement manufacturing points in the state. The commission's order adopts the Interstate Commerce Commission's new Kansas - Colorado - Oklahoma interstate rate scale and applies it to intrastate shipments of cement in Texas, effective December 12. It is explained that the reduction of existing rates amounts to 33% in some cases. The 30½ cent rate reached now as maximum at 251 miles under the presently applicable Texas mileage scale will become 20 cents at the highest under the new schedules which carry on, however, to 42.5 cents maximum for over 980 miles. The six points affected are Harrys, Eagleford, Fort Worth, Houston, El Paso and Cementville.

Cement Products

Making Centrifugal Pipe on the Canadian West Coast

Plant of British Columbia Concrete Co., Marpole, B. C.

A COMPARATIVELY new development in cement products is the centrifugal pipe, but it has already found considerable favor where a dense pipe is required. Throughout the Middle West there are quite a number of products plants which have been turning out this type of pipe, and in the northwest the manufacture of the product was introduced when the British Columbia Concrete Co. of Marpole, B. C., began operating in May, 1926.

Plant Location

The plant of the British Columbia company is very well situated in a small town only a short distance from Vancouver, B. C. This affords it a very good market for its product, and provides good shipping facilities. It is located on the Fraser river and thus opportunity is found to bring cement by boat directly to the company's dock from the cement plant at Vancouver. Sand and gravel for the operation are brought by auto truck to a pit beside the plant, from which they are elevated to bunkers over the mixers.

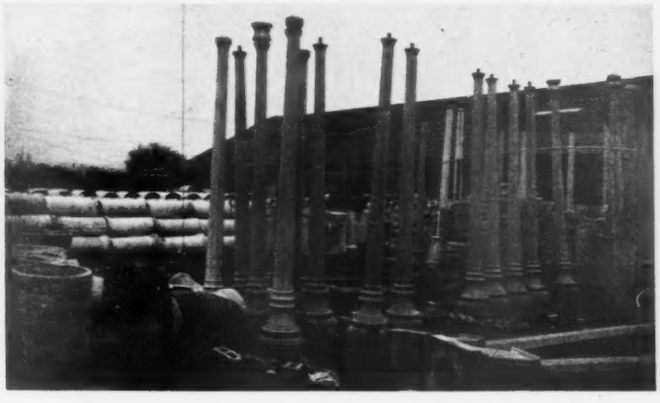
The plant uses the Hume centrifugal process and makes pipe in all sizes from 8 in. to 42 in. in diameter. In this process no inner mold is required for the pipe. The mold is placed on one of the revolving collars of the table and spun slowly while it is being filled with the wet concrete, and this turning motion forces the material to an even thickness over the whole mold. Then the turning is quickened and the concrete is compacted into a dense mass against the mold. After revolving for a little time, the machine is stopped and the excess water is drained off. Then it is again spun and the inside of the pipe is burnished with steel pipe, giving it a dense, non-frictional, and non-corrosive surface. About twelve to fifteen minutes is required to complete the whole process.

Pipe Machinery

Only two spinning machines are used at the British Columbia plant—one for the smaller sizes of pipe, and the other for the large pipe. The former has a capacity of six molds at a time, while the machine for the large pipe will spin four molds of the 15 to 21 in. sizes, 3 molds of the 24 in. size, or two of a larger size. Each machine is driven by a separate motor connected through a Reeves variable speed transmission, which permits a slow or fast revolution as desired. Both machines are operated by the same crew of men, since they can be

The company makes a line of building units as well as pipe

Looking over the large storage yard



Lighting standards are also made by spinning

filling one set of molds while the other set is spinning. Only one mixer is needed for the two machines.

The molds for sewer pipe in sizes from 8 to 12 in. are 6 ft. long, and are divided in the center by a ring, thus making two 3-ft. lengths. The collars on which the pipe molds revolve are adjustable to suit the diameter of the pipe. The pipes for the sizes up to 21 in. have bell ends, these bells being made similarly to the balance of the pipe. Above that diameter the pipes have tongue and groove ends. The larger sizes of pipe are made in molds 8 ft. long, which can, if desired, be divided in the center by a ring to form two 4-ft. lengths. The larger pipe are all reinforced.

Curing the Pipe

When the pipes are removed from the spinning machine, they are placed in a steam chamber for twelve hours before the molds are removed. Then they are placed in the storage yard for a ten-day period of seasoning. During the latter period they are under a spray of water.

Sewer and culvert pipe have been the chief output of the plant, but recently quite a considerable amount of pipe has been made for irrigation work. The pipe seems to be very well suited to use for this purpose where it carries water under pressure.

Other Products

In addition to the production of pipe at the British Columbia plant, the company also manufactures other cement products including concrete building tile and street light standards. A special mix using mica-spar and granite aggregate is employed for the light standards, and when the outside film is removed the aggregate provides a bright and permanent surface. With these products being manufactured beside the pipe, it is necessary to maintain a large force of men, and during the busiest part of the season an average of 50 men may be employed at the plant.

Concrete Units for 40-ft. Bins

Southwest Concrete Products Co. Manufactures the Units and Constructs the Buildings

THERE has been considerable development in recent years of special concrete construction units, and at the present time the average cement products manufacturer has at least one specialty which he places alongside of his regular cement block in importance. These special pieces may be catch basin block, coal pocket staves, centrifugal concrete pipe, or any of the other many varieties of concrete wants that are on the market today, but whatever they are, it is certain that the manufacturer sees to it that the product is widely known, thus, in a measure, advertising his standard products.

At the present time there is a tendency to specialize even to a greater extent, and a number of companies have started up with the purpose of manufacturing one single patented product. A notable example of this specializing is seen in the plants of the Circle Concrete System, Inc. of Beeville, Tex. This system holds the patent rights to a new method of circular concrete construction and is aiding the establishment of local companies throughout the country which will manufacture these units, paying a royalty to the main corporation. The plants are to be under local management, and entirely independant of the Circle System, except for the payment of the royalty.

The first plant of the Circle System is the Southwest Concrete Products Co., also of Beeville, Tex. This company has only been incorporated a short time but has successfully introduced its product in southern Texas already. The plant of the company was started in a small way but with the installation of more machinery it has grown to quite a capacity.

Types of Units Made

The company manufactures two types of

Courtesy of Popular Science Monthly

Circular construction units and sectional units made in the plant of the Southwest Concrete Products Co.

Yard of the Southwest Concrete Products Co., Beeville, Tex., showing method of making circular units

units. One is a complete ring of concrete, used for smaller construction, and the other is a section of a circle for building up into larger jobs. The Circle System claims no special formula for the mixing of the concrete. The mix used at the Southwest Products plant is the usual mix for concrete building units, although the company makes a point of using good washed and graded aggregate. The unusual feature of the product is the design of the ring and the section of the circle, with particular registering grooves. All the units are reinforced with steel bands. Steel forms are used in making all the products.

Seasoning

When the units are completed they are allowed to cure for six weeks. This seasoning permits the product to attain a greater strength before it is laid, and, moreover, by that time the unit has expanded or contracted as much as it is ever liable to, thus eliminating that source of failure from the structures.

For ordinary catch basins, cisterns or other small construction jobs the complete circle is used. The usual unit is 6 ft. in diameter, 4 in. thick, and 6 in. high. These units weigh approximately 400 lb. In larger construction work, such as silos, bins and similar structures which frequently are 40 ft. or more in height, the sections of the circle are used. These are about 7 or 8 ft. in length, and have very nearly the same cross section as the circular units. Each section weights about 160 lbs. Frequently a double wall construction is built in the larger size bins, one set of units being placed within the other, and anchored together with cross ties, leaving an air space between.

Constructing the Bins

It is claimed that the construction of various structures with these units is both simple and economical. Although any unskilled labor may be employed in building the smaller structures, the Southwest company maintains equipment for installing the units should the customer desire to have them do the work. The company constructs practically all of the larger buildings. Motor trucks are used entirely for this phase of the work. Distribution of the production is also handled almost exclusively by truck.

N. W. Brown is president of the Southwest company, and Paul Krause is secretary and treasurer. A. L. Chivers of Beeville is associated with the inventor, Hans Sorenson, in the management of the Circle System.

Carney Co. Cement Plant Damaged by Fire

A FIRE at the Mankato cement mill of the Carney Co., Mankato, Minn., partially destroyed the plant and resulted in damage estimated at $125,000. The fire started in the upper floor of the main building, and destroyed this building and most of the machinery. The plant will be rebuilt on the present site immediately, according to L. J. Carney, treasurer of the company.—*Rochester* (Minn.) *Bulletin.*

Austrian Magnesite Industry

THE Austro-American Magnesite Co. Ges.m.b.H. in Radenthein (Carinthia) has been amalgamated with the Allgemeine Automobil A.-G., in Vienna, which is closely connected with the Wiener Bankverein. The company has been converted into a limited company.

The Austrian magnesite industry includes the following works: (1) The Radenthein works owns quarries in the Millstatt Alps. The works are situated in Radenthein. The "Heraklit" factory is in Ferndorf (Drau Valley). Altogether, these employ 800—1000 workmen; a colliery attached, producing 20,000 tons a year, employs 150 men. The works manufacture sintered magnesite to be used for smelting works, magnesite stones, caustic magnesite for xylolith flooring, "Heraklit" plates, and building plates. The production nearly equals that of the Veitsch Magnesite Works. (2) The Veitscher Magnesitwerke A.-G. owns the Veitsch, Trieben, Breitenstein and Eichberg works; they produce mostly sintered magnesite. (3) The Steirische Magnesit-Industrie A.-G. have their works in Neuberg, Oberdorf and Kraubath. They are partially closed down.

Ninety per cent of Austrian sintered magnesite is exported. In 1925 the export amounted to 80,000 metric tons, i.e., two-thirds of the pre-war export. As Austrian magnesite is especially suitable—it is said to be the best—for metallurgical purposes, neither the high import duties of the U.S.A. nor the new deposits found in that country have been able to hinder the Austrian export. In fact, the magnesite industry is the most important exporting industry of Austria.—*Jour. Soc. Chem. Ind.*

Another Sand and Gravel Producer Goes Into Products Game

THE Monessen Sand and Gravel Co., Monessen, Penn., a growing concern on the river bank, has begun the manufacture of concrete building blocks at the rate of a thousand blocks a day.

Beginning about two years ago with handling sand and gravel only, the Monessen Sand and Gravel Co. now handles, in addition, coal, concrete blocks, lime, cement, plaster and crushed stone. From a derrick and a sand bin it has grown to a concern operating a fleet of trucks, with three large bins for handling material and half a dozen buildings to house the business.—*Monessen* (Penn.) *Call.*

Concrete Blocks Made by Convicts in New York Penitentiary

CONCRETE blocks are now being made in the county penitentiary at East View, New York, according to the *Mount Kisco* (N. Y.) *Times.* The business was begun by the needs of the penitentiary for a new barn on the farm on which some of its prisoners are employed. Aggregates are obtained on the prison lands.

County prisoners are employed to make other concrete products, including sewer manholes, in some southern cities. Memphis, Tenn., has a plant employing convict labor in this way.

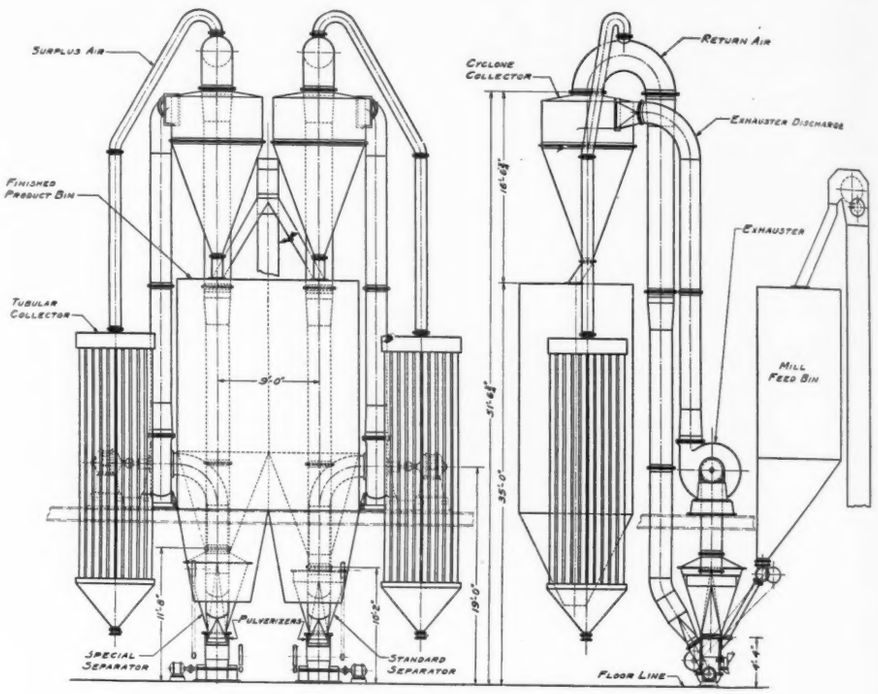
New Machinery and Equipment

Air Separation Systems for Preparation of Chemical Hydrate

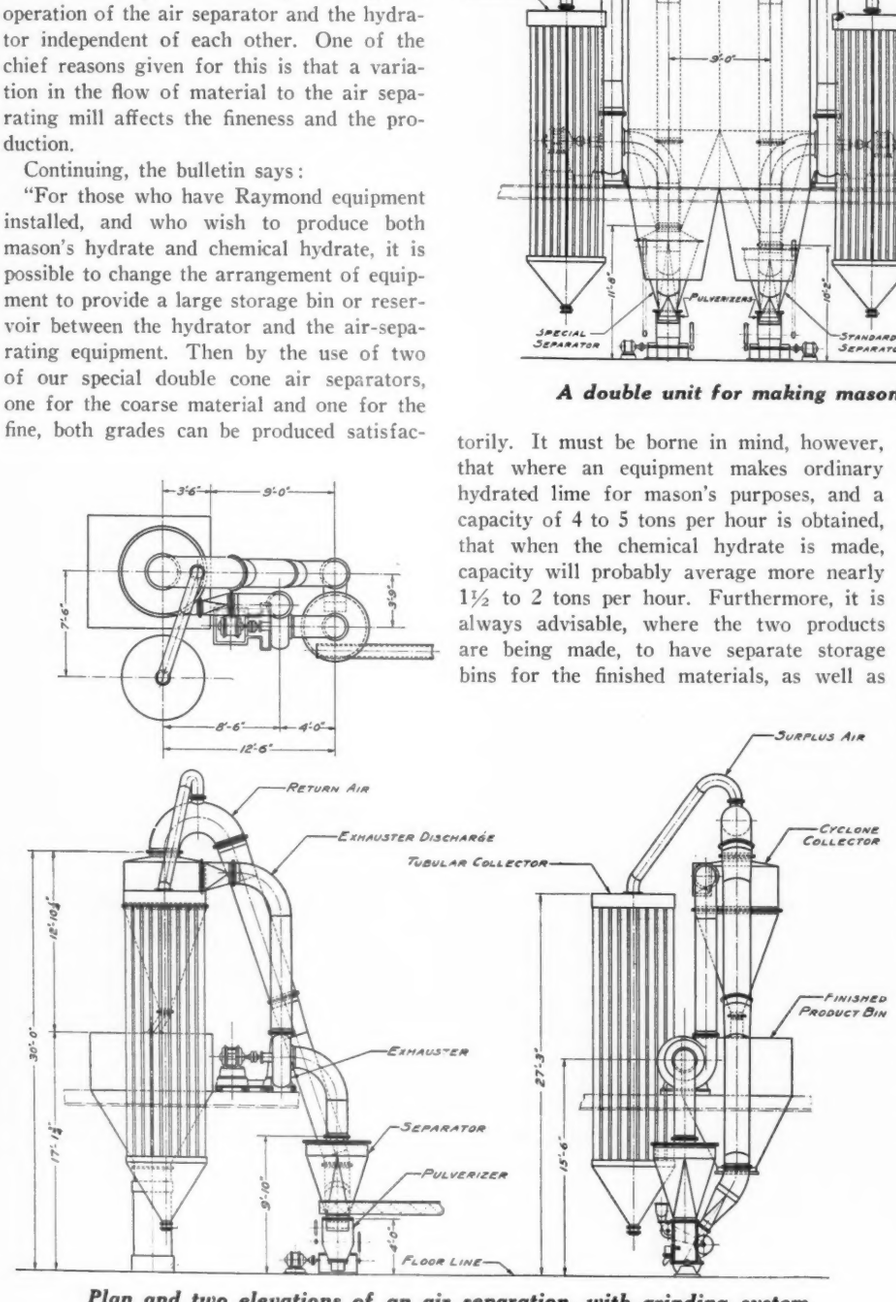
A RECENT bulletin from Raymond Bros. Impact Pulverizer Co., Chicago, Ill., conveys some interesting and informative data on the design of a hydrating plant for the production of chemical hydrate and standard hydrate. The satisfactory production of chemical hydrate, the bulletin states, can be accomplished best by making the operation of the air separator and the hydrator independent of each other. One of the chief reasons given for this is that a variation in the flow of material to the air separating mill affects the fineness and the production.

Continuing, the bulletin says:

"For those who have Raymond equipment installed, and who wish to produce both mason's hydrate and chemical hydrate, it is possible to change the arrangement of equipment to provide a large storage bin or reservoir between the hydrator and the air-separating equipment. Then by the use of two of our special double cone air separators, one for the coarse material and one for the fine, both grades can be produced satisfactorily. It must be borne in mind, however, that where an equipment makes ordinary hydrated lime for mason's purposes, and a capacity of 4 to 5 tons per hour is obtained, that when the chemical hydrate is made, capacity will probably average more nearly 1½ to 2 tons per hour. Furthermore, it is always advisable, where the two products are being made, to have separate storage bins for the finished materials, as well as separate packers. This is to prevent mixing of the two when changing from one material to another, and running the chance that, when making the extremely fine chemical hydrate, some of the mason's hydrate will become mixed with the chemical hydrate and spoil a car of finished product.



A double unit for making mason's hydrate and chemical hydrate



Plan and two elevations of an air separation, with grinding system, for chemical hydrate

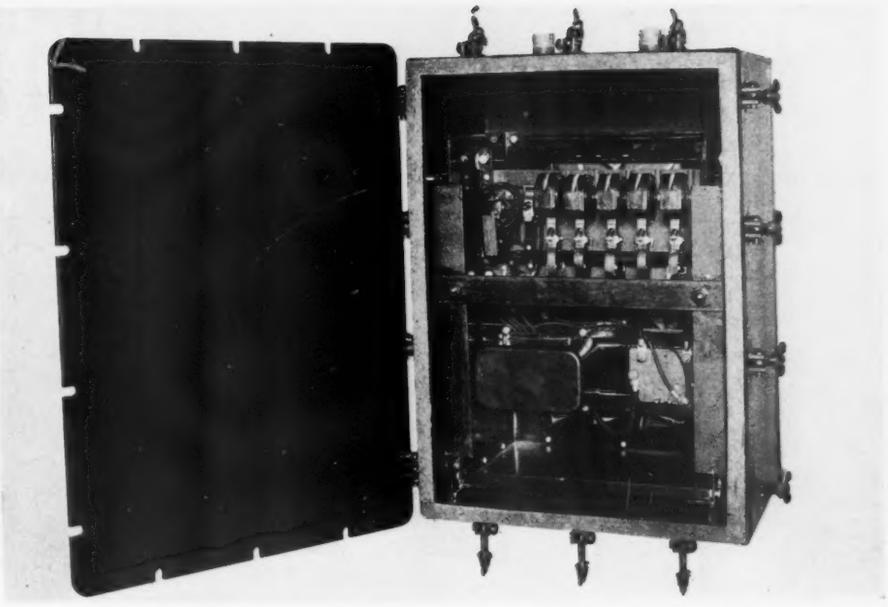
"The ideal arrangement for producing both products is as illustrated above. We have indicated the use of an elevator to carry the lime as it comes from the hydrator to a large storage bin. From this bin we use two special hydrated lime feeders, each one feeding to a separate Raymond mill unit. One of these units would be employed exclusively for making mason's hydrate and the other for chemical hydrate. The proper kind of air separator would be used on both units. The exhaust fan, piping, collector and tubular system would be the same on either one. Each mill discharges to a separate product bin, from which the material would be packed by separate baggers. Our pneumatic feed controls would be used on each of the hydrated lime feeders, permitting the maximum production whenever either mill were thrown into operation. This pneumatic feed control, a new device, is controlled by change of vacuum in the air separating system and is designed to keep an average constant load in the machine at all times.

"This arrangement, we believe, would give the most ideal condition in a plant for producing any grade of hydrated lime that was required."

Boiler-Plate Enclosing Cases

DUST-TIGHT, boiler-plate enclosing cases for wall mounted, general purpose starters are announced by the General Electric Co., Schenectady, N. Y. These are recommended by the manufacturers for dusty installations, such as cement mills, crushing plants, mines, lime plants, and other places for installations where mechanical strength is desired and for installations where protection against steam or fumes is necessary.

The cases are constructed of ¼-in. boiler-plate steel with welded joints. The front is covered by a boiler-plate door which swings on interchangeable hinges, opening either to the right or the left. This door is clamped against the machined surface of the boiler-plate case by means of thumb screws. A vellumoid gasket is cemented to the enclosing case and this is said to insure a good, dust-tight fit between the cover and the case proper. Conduit openings are provided for bringing the leads to the case.

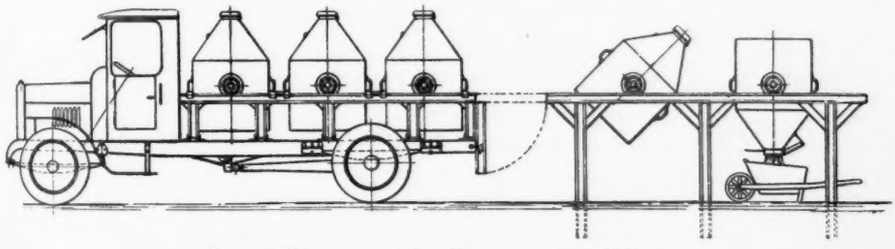


Dustproof and fireproof case for starters in dusty places

German Carrier for Bulk Cement and Lime

A RECENT issue of *Baumarkt* (Germany) carries an interesting description and illustration of a new development in shipping bulk cement, lime or other materials. This has been patented by the National Automobile Co., A. G. Berlin, Oberschoneweide, Germany,. The reproduction below shows the large diameter containers of galvanized iron used for shipping these materials mounted on special transportation cars.

With reference to the cut, a 5-ton truck has a platform, built back of the driver's seat, which supports three watertight riveted galvanized iron tanks in which cement is to be shipped. These tanks are made tapered towards the top, are tightly closed by means of bolts and lids and have a capacity of 2 cu. yd. each. For light transportation two of the tanks are provided with rollers on opposite sides, so that they can be securely fixed on the frame by changing their position. The back part of the frame is collapsible to allow a connection with the supports of the tanks located at the same elevation. The dumping of the tanks is effected by rotating them 180 deg. on the rollers. The tapered part is thus turned downward and by opening the lid and drawing the bolt complete or partial unloading into the cars below is made possible. The tanks are kept firmly in place during transportation.



A new German carrier for cement and lime

New Powder Bag

AT the suggestion of and in co-operation with several leading mine operators, the E. I. du Pont de Nemours Co., Wilmington, Del., has developed a powder bag for the economical, safe and practical carrying of high explosives from storage to the working face.

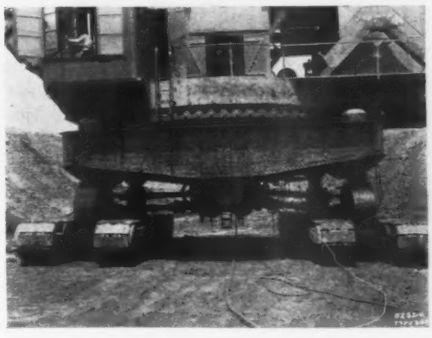
The material used in making the bags is a specially treated fabric which is waterproof and resistant to fungus, dry rot, acid waters, vitiated air and all similar underground conditions. It is also a non-conductor of electricity. Two types—pouch and knapsack—are made and the capacity of the bags varies from 50 to 125 sticks of dynamite.

New Spur Gears

THE Hill Clutch Machine and Foundry Co., Cleveland, Ohio, has developed a gear design which has forged steel teeth and a semi-steel hub. The construction is simply an annular forged ring in which is cast a hub either with web or arms, depending on the dimensions. After casting the completed gear is finish machined and the teeth cut. Sound, homogeneous teeth are said to be assured with this construction, the forged ring being of tough steel. The junction of the steel rim and semi-steel center is a laminated weld of steel and iron and the finished gear is one integral piece. The thickness of the forged steel rim is proportioned to the teeth. Any height of tooth or width of face can be cut.

Large Electric Stripping Shovel

THE Northern Illinois Coal Corp. of Chicago, Ill., is soon to put in operation on its property near Verona, Ill., a Marion new Type "5480" electric stripping shovel, said to be the largest ever built. The shovel is to be mounted on crawling traction trucks equipped with Marion hydraulic equalizing jacks which are claimed automatically to hold the machine level while traveling or working on rough or uneven ground surfaces. It carries a 90-ft. boom, 60-ft. dipper handle and 12-cu. yd. dipper, and will strip overburden up to approximately 50 ft.



Base of a big shovel

The electrical equipment is of General Electric design and consists of two 255-hp. motors on the hoist, two 75-hp. motors on the swing and one 150-hp. motor on the crowd. A 700 kv.a. motor generator set furnishes power to the individual motors.

News of All the Industry

Incorporations

Ferndale Stone Co., Ferndale, Mich., $20,000.

Lebarr Sand and Gravel Co., Wilmington, Del., $25,000.

Clarke Siefried Gravel Co., Alexandria, La., has filed papers of final dissolution.

International Terrazzo and Tile Co., Milwaukee, Wis. Increased capital stock from $15,000 to $25,000.

Bedford Limestone Corp., Bloomington, Ind., 1000 shares, no par value. To operate stone quarries and mills.

Lamp Rock Co., San Francisco, Calif., $100,000. C. F. McCann, John Cummings and K. C. Lougherty.

Denny Road Quarry Co., St. Louis, Mo., $20,000. H. E. Billman, Old Warson Rd., St. Louis, J. W. McCullough and others.

E. T. Crane & Co., Inc., Portland, Ore., $2,000. To engage in sand and gravel business. M. M. Crane, W. P. Loffburer and Fred Mayer.

Stark Sand and Gravel Co., North Edgefield, Ohio, $2,000 capital stock and 1000 shares common stock. M. M. Ruthstone, Ida M. Smith and W. A. McIntyre.

Degens Cement Floors, Inc., Pontiac, Mich., $10,000. To manufacture cement products. H. G. Degens, Pontiac; Theresa Degens, Pontiac, and James W. Wyse, Detroit.

Montrose Cement Block and Construction Co., Wakefield, Mass., $75,000, 7500 shares $10 each. President and treasurer, Joseph Cantone, 292 Salem St., Wakefield, and Leonard H. De Marco.

Silitac Corp., Chicago, $200,000 common and $100,000 preferred. To manufacture and deal in marble cement, oil tank cement, sand silex, stone and silicates. James J. Magner, C. R. Larrabee, R. McCormick.

Quarries

Flint Crushed Gravel Co., Des Moines, Iowa, has taken an option on 190 acres of land east of Winterset, Iowa, and is investigating the rock, with the purpose of opening a limestone quarry on the property.

Bethany, Mo. Work is going forward on pumping out the quarry formerly owned by the Bethany Crushed Stone Co. This quarry was sold to C. Montgomery after it was flooded some time ago and it is reported that it will be resold after the water is out and will be operating again shortly.

Sand and Gravel

Zanesville Washed Gravel Co., Zanesville, Ohio, sustained a fire at its Dresden, Ohio, plant on November 12, resulting in damage estimated at $15,000, but shipments from the plant were continued as usual.

Paul Ales, Inc., Lockport, Ill., sand and gravel company, has purchased 17 acres north of the Chicago drainage canal, and adjacent to the company's property, from the Chicago Sanitary District. It is understood that the gravel company purchased the land for a dock site.

New Westminster, B. C. A local syndicate has taken an option on 300 acres at Mary Hill at the confluence of the Fraser and Pitt rivers, and will develop a sand and gravel plant on the property if investigation proves there is a large enough supply to warrant the project.

Lutesville Sand and Gravel Co., Cape Girardeau, Mo., has been investigating deposits near Black Rock, Ark., with the intention of locating a plant there to ship to the Memphis territory. It is reported that the plant will cost approximately $75,000 and will have a capacity of 40 carloads daily.

Charles Warner Co., Wilmington, Del., building supplies, operating the West Jersey Sand and Supply Co., Philadelphia, and other interests, has begun the erection of a new automatic concrete-mixer plant at Philadelphia, to be provided with storage bins, hoppers, belt conveyors and other mechanical handling equipment, including loading apparatus.

Cement

Peerless Portland Cement Co., Detroit, Mich., is reported to have closed down its plant at Union City, Mich., for the remainder of this season.

Portland Cement Association. The Los Angeles offices of the association have been moved to the Union Bank Bldg.

Superior Portland Cement Co., Superior, Ohio. A fire in the company's general store caused damages estimated at $30,000 on November 6.

National Cement Co., Montreal, Canada, is contemplating building an addition to its plant with capacity of 300,000 bbl., with the intention of bringing the annual capacity up to 1,200,000 bbl.

Phoenix Portland Cement Co., Birmingham, Ala., subscribed 100% to the Birmingham Community Chest, each employe giving one day's pay or more. The total amount contributed was $5,104.87.

Colorado Portland Cement Co., Denver, Colo., has closed its plants at Concrete and Portland, Colo. Executives of the company say the plants are shut down every year for repair and this closing is not caused by the coal strike.

Old Mission Portland Cement Co., San Francisco, Calif., has temporarily closed the raw grinding and burning departments at its mill at San Juan Bautista, Calif., due to the large surplus stock on hand. All other departments are operating as usual.

Keystone Cement Co., Allentown, Penn. Night shifts have been added to the force building the new Keystone company plant at Bath, Penn., so that it can be finished before cold weather comes. The machinery for the mill is being shipped from Germany.

Lawrence Portland Cement Co., Siegfried, Penn. The staff at work on the new plant at Rockland, Me., which is rapidly nearing completion, gave a dinner to honor Charles A. Porter, vice-president of the Lawrence company, who is now in charge of the work at Rockland, on the occasion of his 60th birthday recently.

Olympic Portland Cement Co., Seattle, Wash., has installed a new $60,000 electric shovel at the old International Limestone Co. quarry near Bellingham, Wash. The Olympic company intends to install two crushers at the International quarry, and it is reported that when these are completed the quarry at Balfour will be abandoned.

Missouri Portland Cement Co., St. Louis, Mo. The following sub-contracts were awarded for the construction of the company's new $2,000,000 plant: Westinghouse Electric and Mfg. Co., motors and switchboard; Moloney Electric Co., transformers; Chandeyson Electric Co., motor generator sets; Fruin-Colnon Contracting Co., concrete foundations and slurry basins; Smith & Brennan Concrete Pile Co., concrete piles; Dixie Machinery Mfg. Co., hammer mills; Stephens-Adamson Mfg. Co., rock feeders; R. H. Beaumont Co., skip hoists; Pennsylvania Pump and Compressor Co., air compressors; Buffalo Forge Co., fans; Traylor Engineering Co., kiln; Falk Corp., speed reducers; Jeffrey Mfg. Co., coal crusher; Richardson Scale Co., automatic scales; Fuller Co., cement pumps; Fuller Lehigh Co., coal pumps; the Mine and Smelter Supply Co., Wilfley pumps; F. L. Smidth & Co., grinding machinery, and John V. Boland Construction Co., concrete chimney. Other contracts are still to be awarded and the plant is expected to be ready for operation by April 1, 1928. F. L. Smidth Co., 50 Church St., New York City, are the engineers.

Cement Products

Christoffel Art Stone Co., Milwaukee, Wis., has moved its offices to the Guaranty Bldg.

Minter Co., Medford, Mass., has completed an addition to its cast stone plant. The addition is 30x100 ft.

Arnold Stone, Brick and Tile Co., Jacksonville, Fla., is reported to have recently purchased a site for a new plant for the manufacture of cast stone. M. A. Arnold is president of the company.

Northwest Concrete Products Association has announced a $200 prize to be awarded to a student in the department of civil engineering of the University of Washington for exceptional investigation and study in concrete.

Atlanta, Ga. A company formed with R. V. Grayson, Healey Bldg., Atlanta, as president, and S. J. Moss as secretary, is reported to be expending about $50,000 for the erection of a plant to manufacture building tile. The company has secured the patent rights and local franchise from W. E. Dunn Mfg. Co., Holland, Mich. Machinery is now being installed for an initial output of 100,000 tiles per month, with plans to increase the capacity later.

Silica Sand

White Rock Crystal Silica Co., Browntown, Wis., is reported to be planning the erection of a plant to cost $35,000 for the production of glass sand. Dr. Robert Wehann, of Rockford, Ill., who is directing the new company, has leased property at Browntown which contains deposits of silica sand of good quality.

Clinch Mountain Silica Sand Co., Silica, Va., is planning the installation of a complete system of air separation for its 140-mesh silica ground for the pottery trade. The company is considering the purchase of a complete unit with a minimum capacity of 300 tons per 10-hour day, which will necessitate crushers, pulverizers, screens, elevators and other equipment.

Gypsum

British Columbia Gypsum Co., Falkland, Grande Prairie, B. C., mined more than 10,000 tons of gypsum during 1926. The output was valued at $87,000.

Gulf Gypsum Co., Falfurias, Tex., has requested the city of Pensacola, Fla., for permission to establish a terminal in that city, to be located at the municipal dock and adjacent to good rail transportation.

Houston, Tex. A demonstration of the application of Textone, a product of the U. S. Gypsum Co., on Sheetrock was given recently by F. B. Roamer for members of the Builders Exchange of Houston. The reinforced joint system was explained and seven textures of Textone were shown.

Agricultural Limestone

Perry, Fla. The county commissioners and the officials of the First National Bank of Perry have reached an agreement by which the county will furnish limestone to the farmers of the district free of charge from the county quarry at Steinhatchee, and the bank will furnish means of applying the stone to the land. County employes will load the farmers' trucks by steam shovel without cost to the farmers.

Slag

Birmingham Slag Co., Birmingham, Ala., producer of slag and manufacturer of Slagtex building tile, has purchased a half interest in the Standard Building Material Co. of Birmingham, formerly the Standard Fuel and Material Co.

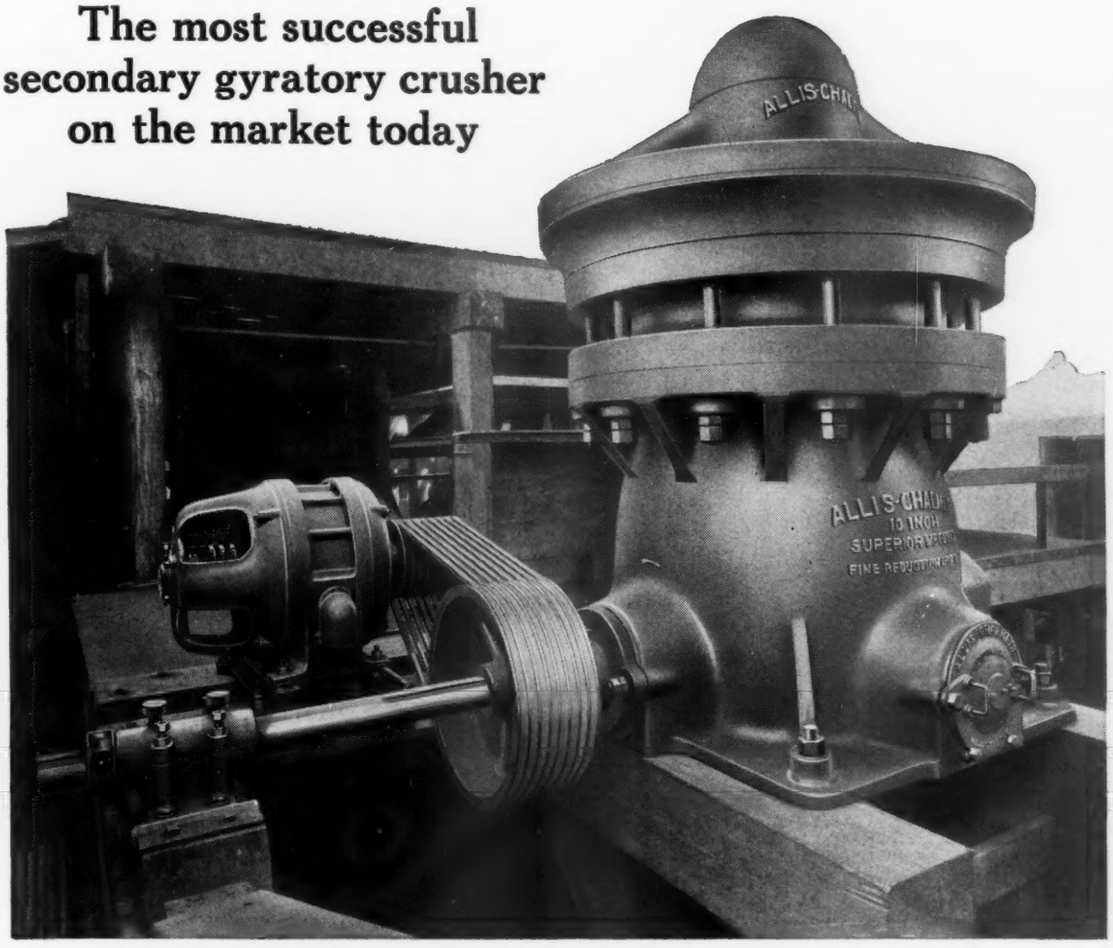
P. J. McGovern, Louisville, Ky., has acquired the rights to a large slag heap at Rising Fawn, Ga., and expects to install machinery capable of getting out 100,000 tons of crushed slag yearly. The slag will be used chiefly for a highway construction material.

Miscellaneous Rock Products

Tampa, Fla. 12,250 tons of phosphate was shipped from the elevators of the Seaboard Air Line in one day recently. The phosphate was shipped on two American ships and one British freighter.

Superior McCully Fine Reduction Gyratory Crusher

The most successful secondary gyratory crusher on the market today



10-inch Superior McCully Fine Reduction Crusher driven through Texrope Drive from 75 H.P. Type "ARY" Motor. Crusher, motor and drive are all of Allis-Chalmers manufacture.

SIZES, CAPACITIES, HORSE POWER AND WEIGHTS

Size of Crusher in Inches	Two Feed Openings, Size Each in Inches	Capacity Per Hour in Tons of 2,000 Pounds — Size of Discharge Opening in Inches												Driving Pulley		H.P. Required	Weight of Crusher in Pounds
		¾	⅞	1	1¼	1½	1¾	2	2¼	2½	3	3½	4	Size in Inches	R.P.M.		
6	6x40	24	28	32	40	48								36x12½	500	40 50	32,000
10	10x52					80	94	107	120	135				36x19	450	75 100	64,000
18	18x68									250	300	350	400	44x25	400	150 200	182,000

ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.

When writing advertisers, please mention ROCK PRODUCTS

Personals

J. E. Zahn, secretary of the United States Portland Cement Co., Denver, has been appointed a member of the finance committee of the Denver Chamber of Commerce.

Melvin A. Traylor, president of the First National Bank of Chicago, has been elected a director and chairman of the finance committee of the United States Gypsum Co., succeeding Ralph Van Vechten, who died recently.

Dr. W. D. Coolidge, assistant director of the research laboratory of the General Electric Co., has been awarded the Hughes medal by the Royal Society for "distinguished work on X-rays and the development of highly efficient apparatus for their production."

Obituaries

W. J. Hein, secretary, treasurer and director of sales of the Her-born Engineering and Manufacturing Co., died on November 19.

Jackson E. Shutt, manufacturer of cement block, of Elkhart, Ind., died recently at his home following an illness of eight months. He had lived in Elkhart for sixty years and was owner of the Shutt Cement Products Co.

Arthur G. Hendricks, vice-president and general manager of the Harnischfeger Corporation, Milwaukee, Wis., died at Milwaukee recently following a nervous breakdown. Mr. Hendricks had been with the Harnischfeger Corporation for many years, having been general manager for the past ten years. He was 48 years old.

Manufacturers

Lincoln Electric Co., Cleveland, Ohio, has appointed R. M. Plympton salesman in charge of consumer motor business in Chicago.

Northern Blower Co., Cleveland, Ohio, will supply a dust-collecting system for the Volunteer Portland Cement Co. plant at Knoxville, Tenn., and also for the Lawrence Portland Cement Co. plant. The equipment is being manufactured under the trademark "Norblo," which was recently registered by the company.

Worthington Pump and Machinery Corp., New York, will display two new pumps at the Power Show in New York in December. One is a new high-pressure multi-stage centrifugal pump for boiler feeding and similar jobs, and the other is a 4-in., 3-stage special oil pump having a self-regulating feature.

General Equipment Machinery Co., Miami, Fla., has been recently incorporated and has taken over completely the machinery department of the I. E. Schilling Co. of that city. The president of the latter company, I. E. Schilling, has been made president of the General Equipment Co. Chris Dorn is vice-president and manager, J. B. Ober is secretary, and L. W. Coffeen is treasurer of the new company. The company will handle sand and gravel equipment, elevators, hoists, mixers and similar machinery.

Trade Literature

NOTICE—Any publication mentioned under this heading will be sent free unless otherwise noted, to readers, on request to the firm issuing the publication. When writing for any of the items kindly mention ROCK PRODUCTS.

Fuse Puller. Announcement of safe tool for removing fuses. TRICO FUSE MANUFACTURING CO., Milwaukee, Wis.

G-E Bulletins. GEA-822 on ball-bearing construction general purpose motors; **GEA-827** on capacitors for power-factor correction.

Machining Alloy Steel. Nickel Steel Bulletin No. 11, on machining various alloy steels, illustrated with diagrams. INTERNATIONAL NICKEL CO., New York, N. Y.

Three-Speed Gasoline Cranes. Illustrated bulletin on locomotive cranes powered by gasoline engines, having three speeds. AMERICAN HOIST AND DERRICK CO., St. Paul, Minn.

Westinghouse Linestart Motors. Illustrated bulletin on motors requiring only low starting current. WESTINGHOUSE ELECTRIC AND MANUFACTURING CO., East Pittsburgh, Penn.

Cement Products Pallets. Illustrated bulletin on metal pallets for the cement products industry. **Material Bins.** Announcement of "Commercial" metal bins. **Contractors' Equipment.** Illustrated bulletin on construction equipment. COMMERCIAL SHEARING AND STAMPING CO., Youngstown, Ohio.

Crushers and Quarry Equipment. Catalog No. 14-B on Acme crushers of jaw, hammer and roll type, conveyors and feeding equipment, quarry cars, buckets and bucket elevators, shaft and roller screens, bins, power units and complete crushing and screening plants for stone, sand and gravel, etc. ACME ROAD MACHINERY CO., Frankfort, N. Y.

Merger of Indiana Quarries Is Proposed

ABOUT $20,000,000 in mills and quarries is involved in a merger of the holdings of several independent stone companies in the Bloomington-Bedford district of Indiana which is expected to be completed next month. This was indicated when Mark O'Brien, a representative of the John Underhill Fisher Co. of Chicago, which is reported here to have eastern backing, took options on many of the smaller companies. About 15 companies are involved in the deal.

If the merger is completed, it will put two large stone companies in the Bloomington-Bedford field, the other being the Indiana Limestone Co., organized a few months ago by the merger of several of the larger independent companies.—*Indianapolis* (Ind.) *News.*

County Highway Construction To Be Featured at Coming Road Convention

COUNTY HIGHWAY OFFICIALS, representing each of the 3070 counties of the United States, will assemble in Cleveland on January 9 for the first annual meeting of the national association of county highway officials. The meeting will be one of the most important ever held by those connected with the construction, maintenance and operation of county highways.

The meeting was called following the organization last June of a new County Highway Officials' Division of the American Road Builders' Association, of which Thomas J. Wasser of Jersey City, N. J., is president.

The sessions will comprise the reports of various standards committees, the objectives of which are to draw up standards for county administration, finance, legislation, construction, maintenance and operation of county roads. The reports will consist of a summary of the best practices as now in force in the various counties of the United States, together with recommended standards.

The convention which will be held in Cleveland is the world's largest good roads convention and in connection with it will be held a road machinery and equipment exposition of over 300 carloads of road building and maintenance equipment, covering more than four acres of floor space. In addition to the county officials, approximately 25,000 other persons directly connected with the highway industry will attend.

The annual business meeting of the county highway officials will be held on Thursday, January 12, with President Wasser presiding. Reports of various committees will be given and routine business transacted.

The convention and road show is expected to give new impetus to the construction of county roads on a new economical basis designed to eliminate waste of county funds and increase the efficiency of county roads Every county official directly or indirectly connected with highway operation, construction or maintenance is urged to be present. Reduced fares have been granted by all railroads to those who attend.

In addition to the gigantic machinery exposition and convention, estimated to cost over $3,000,000, there will be a large number of exhibits presented by the United States Bureau of Public Roads, the Department of Commerce, various states of the Union and the nations of South and Central America.

Canadian Quartz Production Increased in 1926

FINALLY revised statistics just issued by the Mining, Metallurgical and Chemical Branch of the Dominion Bureau of Statistics at Ottawa show that the production of quartz (silica) in Canada during 1926 reached the total of 232,082 tons valued at $553,161. An increase of 17.6% in quantity and 52% in value is indicated by these figures when compared with the totals for the preceding year of 197,224 tons worth $363,612.

Imports of silex or crystallized quartz into Canada during 1926 totaled 2554 tons with a valuation of $60,070. Flint importations increased considerably from the 1925 total and amounted to 4731 tons appraised at $49,635.

Capital employed by the 17 firms operating in the Canadian quartz industry was $1,056,705. Employment was furnished 17 salaried employes and 226 wage earners; their total earnings amounted to $208,839. The cost of fuel and electricity used in this industry was $44,311. Primary power employed consisted of 15 units with a combined rating of 721 hp. Electric motors in operation during the year were reported at 14 units with a total rating of 533 hp.

PRODUCTION IN CANADA AND IMPORTS OF QUARTZ, 1926

	Tons	Value
Production—		
Nova Scotia	8,333	$ 29,018
Quebec	24,550	107,779
Ontario	192,733	339,304
British Columbia	6,466	77,060
Total	232,082	$553,161
Imports—		
Silex or crystallized quartz, ground or unground	2,554	60,070
Flint	4,731	49,635

PRINCIPAL STATISTICS OF THE QUARTZ INDUSTRY IN CANADA, 1925-1926

	1925	1926
Number of firms	14	17
Capital employed	$1,005,159	$1,056,705
Number of employes—		
On salary	15	17
On wages	138	226
Total	153	243
Salaries and wages—		
Salaries	$ 33,409	$ 28,351
Wages	112,085	180,488
Total	$ 145,494	$ 208,839
Cost of fuel and electricity	$ 20,495	$ 44,311
Selling value of products	363,612	553,161